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# THIS WEEK'S National Petroleum NEWS

## Index to Coming Meetings

*National Oil Show*, Sherman Hotel, Chicago, Jan. 19 to 25.

*Independent Oil Men's Association of New England*, American House, Boston, Mass., Jan. 22, 23, 24.

*Oklahoma Oil Jobbers Association*, Huckins Hotel, Oklahoma City, Jan. 23, 24.

*National Petroleum Association, Fire and Safety Marshals*, William Penn Hotel, Pittsburgh, Pa., Jan. 24.

*Wisconsin Petroleum Association*, Hotel Pfister, Milwaukee, Jan. 28, 29.

*Northwest Petroleum Association*, North Dakota division, Grand Forks, N. D., Jan. 30, 31.

*Iowa Petroleum Association*, Fort Des Moines Hotel, Des Moines, Ia., Feb. 11, 12.

*Ohio Petroleum Marketers Association*, Deshler-Wallick Hotel, Columbus, O., Feb. 19, 20, 21.

*Western Petroleum Refiners Association*, Shreveport, La., March 10, 12.

*Michigan Oil Men's Association*, Statler Hotel, Detroit, March 19, 20, 21.

*American Association of Petroleum Geologists*, Roosevelt Hotel, New Orleans, La., March 20, 21 and 22.

*American Oil Burner Association and National Oil Burner Show*, Hotel Stevens, Chicago April 7 to 12.

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## General

Majors' Practices at Leased Stations Trouble Spots Under Code ..... 19
Form for Agents Agreement Used by Ohio Standard ..... 22
Political Action Urged to Cut Montana Gasoline Prices ..... 23
Increases in Rail Rates in Southwest Proposed by I. C. C. Examiners ..... 24
A.P.I. Report of Refinery Operations ..... 25
Santa Fe Springs Now Nearing Sand Will Test Proration's Strength ..... 31
Drilling Campaign Begins in New Pool Opened in Seminole County ..... 39
Nearby Farm Crops Went Into This Caving Hole to No Avail ..... 46
Watching the Mid-Continent from an Easy Chair ..... 47
Drilling Reports from Leading Fields ..... 44, 45, 48

## Engineering

Program for Calibrating Test Apparatus Should Have Industry's Cooperation ..... 26
Method for Procedure is Suggested—*by C. Simnett* ..... 27
Tentative Test Methods for Density Balance ..... 28
Principles of Oil Field Development—Article III—*by Lester C. Uren* ..... 49
Modern Refining—Science and Practice—Article IV—*by Col. George A. Burrell* ..... 59

## Merchandising

Serviceability of Aluminum Tanks for Trucks is Demonstrated ..... 29
How Story of Fifty Years in Business Was Told Public by Wadhams ..... 67
"A Home-Owned Company" Helps Its Business ..... 73

## Markets

Chicago, Prices Slip in Quiet Trading ..... 77
Mid-Continent, Zero Fuel Oils Active; Prices Higher ..... 79
Refinery Price Tables ..... 80, 82, 83
California, Eastern Buyers Bid 6 Cents for Gasoline ..... 86
Pennsylvania, Large Orders for Kerosene Placed ..... 87
Eastern Domestic, January Buying Fair at Current Prices ..... 88
Gulf Coast, Cased Gasoline, Kerosene Prices Rise ..... 88
Wax, Scale Prices React Slightly ..... 90
Gulf Lubes Continue Quiet ..... 91
Tank Wagon Price Tables ..... 92, 93
Crude Oil Prices, All Fields ..... 91, 95
Complete Seaboard Prices ..... 97

## Departments

The Editors' Viewpoint ..... 33
The Mid-Continent Skyline ..... 35
Our Industry ..... 42
Oil Company Finance ..... 98, 100, 101, 102

L. P. ST. CLAIR, executive vice president of the Union Oil Co. of California, recently was elected vice president at large of the American Petroleum Institute. His election to that office came as a recognition by our industry of the valuable work he has done in advocating an aggressive program of conservation.

During the past year Mr. St. Clair played a prominent part in bringing about the present curtailment of flush fields of southern California. He is credited with being the father of the state's new gas law.

Mr. St. Clair was one of the organizers of the Independent Oil Producers' Agency and has been its president for 20 years. He has been a director of the Union Oil Co. since 1920 and a member of the executive committee for two years. He was made executive vice president of the company last June. He was formerly at the head of the company's production activities.

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# Majors' Practices at Leased Stations Trouble Spots Under the Code

By Roger B. Stafford
N. P. N. STAFF WRITER

CLEVELAND, Dec. 31

THE lease and agency agreement method of obtaining and binding dealer outlets for gasoline and motor oils seems to be the most disturbing factor against the more general adoption of the code of marketing practices by Independent distributors, a canvass of state marketer associations' officers by NATIONAL PETROLEUM NEWS indicates.

Many distributors to whom the lease and agency plan is new, are strongly opposed to it, although distributors who have seen it work for several years with lease rentals based on actual gallonage, and not on estimated future gallonage, see some good in the idea because often its application has proved to be a market stabilizer.

Many Independent distributors believe the lease and agency agreement plan, as now practiced, is merely a means to cut the tank wagon price of gasoline ½ or 1 cent a gallon, and that verbal promises given dealers in order to get them to lease their stations to an oil company and to accept an agency which the oil company may cancel on short notice, violates in spirit the code of ethics.

These promises, of which there is no written evidence, are for painting of buildings other than the station proper, construction of canopies, driveways, and grease racks or pits, and the installation of new gasoline and oil dispensing equipment, automobile lifts, air compressors and other things without expense to the dealer. These are said to be in violation of the spirit of the code of ethics, but not the letter of the code, because the rebuilding and installation of new or additional equipment does not take place until after the dealer has leased his station to the oil company and has, legally at least, become the oil company's agent or employe.

Complaints have been filed with some state committees on the interpretation of the code that the code is being violated in spirit and at least one complaint, that of the Ohio Petroleum Marketers Association, has been made to the board of directors of the American Petroleum Institute.

Most individual complaints concerning this practice seems to be coming from Ohio and the middle west. The lease and agency agreement plan was not entirely new to Ohio before the code went into effect last Aug. 31 but little was heard of it because it was not used widely. With the adoption of the code some of the larger gasoline distributors adopted it in one form or another and simultaneously goaded the hornets' nest.

Some of these accusations of violations of the spirit of the code have been hurled about so much that NATIONAL PETROLEUM NEWS asked some of the larger distributors in the middle west about their marketing policies in the immediate future and particularly about the lease and agency agreements.

THE Standard Oil Co. of Ohio, which adopted the lease and agency agreements after the code went into effect, said it had issued the following instructions to its division managers Dec. 24:

"The following orders relating to the marketing policies of the Standard Oil Co. of Ohio, most of which as you will observe have been in full effect during the year 1929, will be

## Commercial Accounts Committee Named

NEW YORK, Dec. 28.—The committee authorized by the A.P.I. directors at Chicago to consider and make recommendations concerning the commercial account sections of the code of ethics, has been appointed as follows:

Henry M. Dawes, Pure Oil Co., Chicago, chairman; W. C. Teagle, Standard Oil Co. of New Jersey, New York; W. M. Irish, Atlantic Refining Co., Philadelphia; George R. Nutty, Gulf Oil Corp., Pittsburgh; W. T. Holliday, Standard Oil Co. of Ohio, Cleveland; Roy B. Jones, Panhandle Producing & Refining Co., Wichita Falls, Texas, and W. E. Smith, Standard Oil Co. of Kentucky, Louisville.

The committee will meet at 10:30 a.m. Jan. 8 in the A.P.I. headquarters in New York and will report to the institute's board Jan. 9.

observed without variation or exception during the year 1930.

**"Service Station Commercial Discounts**

"During the year 1929 no new business involving commercial discounts whatever has been assumed either through coupon book discounts, discounts to large credit customers, or by rebates at the end of the month or otherwise. This policy will be continued, and since all previous contract customers and contracts such as our public utilities contracts will have expired by January, 1930, will service station business by our company will be at our posted service station price. No exceptions whatever will be made.

"The Standard Oil Co. will observe in all respects the spirit of the code of ethics, and in connection with the commercial discount of the service station, will not allow to any customer a rebate or a discount on his motor oil, or greasing, or otherwise, in order to secure his gasoline business.

**"Tank Wagon Commercial Discount**

"Unlike the commercial discount at the service station there is an economic justification for a tank wagon commercial discount which will be allowed as announced from time to time in our price structure. No variation from this structure will be permitted in order to obtain business or for any other reason. Cartage allowances or monthly rebates will as in the past not be permitted under any circumstances whatever.

**"Photostatic Copies**

"The Standard Oil Co. will adhere to the policy of the code of ethics in giving full publicity to any of its contracts or agreements to any responsible parties interested. As a matter of convenience photostatic copies of contracts, leases, etc., will be furnished to proper parties when requested.

**"The Drive-in Service Station**

"It will be our policy in the future as in the past to lease desirable drive-in service stations for definite periods where the rental does not exceed ½ cent per gallon on the gasoline sold during such period, payable monthly. This rental paid to such dealers is in addition to the regular commission which at present is 3 cents. As in the past all such leases will be duly recorded at the proper county seat with the county recorder, will be for a period of not less than one year without right on the part of the dealer to cancellation, and will contain the consent of the dealer's lessor where such exists. No flat rentals nor minimum guarantees will be permitted in any case.

"In contracting leases with dealers for their drive-in service stations our managers are instructed not to lease any location from a dealer unless such manager is willing to assume full responsibility for making such location pay even though the agency agreement which is signed concurrently with the dealer lapses or is broken.

"In other words, the Standard Oil Co. is interested only in leasing points that have strategic value. In determining what constitutes a drive-in service station, the following will be observed:

"The premises leased must contain pumps, at least one drive, and a building suitable for storing supplies, etc., and housing an attendant. This building must be a separate unit, fully set off by partitions so that complete possession could be given to the lessee in case of forfeiture of the agency.

"This definition will exclude as drive-in service stations, gasoline and oil operations in the parking garage or other garage unless in addition to the other requirements for drive-in service stations such part of the premises as is used in these operations is completely separated from the rest of the garage.

**"Contracts**

"The Standard Oil Co. will observe all bona fide contracts between our competitors and their customers when such contracts are submitted for inspection either photostatic copies or in the original within one week after notice. This policy will prevail both in connection with leases and with other agreements not recordable."

The Standard of Ohio leases stations at ½ cent a gallon rental, payable monthly. Its leases are filed at the office of the county recorded of the county in which the station is situated. This filing is in accord with the interpretation of Rule 2 of the code as adopted by the A.P.I. directors at their December meeting in Chicago.

IN THE Standard of Ohio's lease form there are clauses providing that the lessor or dealer shall pay all taxes, licenses or other assessments levied because of the nature of the business; that the lessee or Standard may remove any equipment from the property within 30 days after the expiration or termination of the lease; that the lessee shall enjoy the property without interference; that if the lessor defaults in the payment of rentals, if he leases the property from a third person, that the lessee shall pay the rentals or other charges and deduct the amount from the rentals due the lessor. In case of fire or other cause which might render the property unusable for service station purposes the rental ceases until the property again is made fit for business and in case the lessee does not act to restore the property in a reasonable time the lease may be canceled.

In case the dealer does not own but leases the property the consent of the owner to a sublease is obtained.

The Ohio company's authorized agents agreement form, reproduced with this article, differs from the form used by the Standard Oil Co. of Indiana. The Standard of Ohio does not sell gasoline and other products to its agents. It places the goods in the station virtually on consignment. The commission on gasoline is 3 cents a gallon which, with the rental, makes the station's margin on gasoline 3½ cents.

THE 3½-cent margin between tank wagon and pump price has become so general under lease and agency plan that some of the larger companies and many of the smaller ones are posting a 3½-cent margin on gasoline to all dealers who operate drive-in service station but are adhering to a 3-cent spread for curb, wayside and commercial accounts.

It was said by the Pure Oil Co. that its continuation of the lease and agency plan would depend on future competitive conditions. It was said the present policy of the company was for a continuation of the plan through 1930 on leases for definite periods with rentals at ½ cent a gallon on the actual gallonage. The 3-cent dealer margin will be allowed in addition to the rental.

No lease is being made or will be made by Pure for a period of less than one year, it was said, and the lease is non-cancellable by the lessor. No flat rentals or minimum guarantees will be used, it was announced. A statement of the company's policy was as follows:

"The premises leased must contain a suitable service station building and have gasoline pumps. Where the building contains more than one class of business, the service station portion must be a separate unit and so divided by partitions that lessee can obtain complete possession. The property must be capable of being entirely segregated in case of termination of the agency.

"No equipment will be offered as a consideration of the lease other than the normal gasoline equipment, oil dispensing units and regular signs. The only painting to be done will include those structures actually used in the operation of the sales of petroleum products.

"The company will not loan money to agents as a consideration of the lease excepting in specific cases, properly approved, where business may be taken from competitors and where such competitors have already furnished money or equipment."

The Standard Oil Co. of Indiana said it had made no change in the form of its authorized agents agreement or lease since the code went into effect. Under its lease the Standard of Indiana pays a flat rental based on the estimated gallonage of the dealer. It aims, it was said, to

pay at the rate of ½ cent a gallon except in Chicago where rentals are higher, but, it was added, the lease and agency plan does not mean much for the company in Chicago where it owns most of its outlets.

Sinclair Refining Co. is using the lease and agency plan, seeking one to five-year leases at ½ cent a gallon rental except in Chicago where the rental is 1 cent a gallon.

One-year leases Sinclair makes, it was said, carry a one-year renewal clause, but the leases are cancellable by the lessee. Leased stations are painted and equipped like Sinclair-owned stations but good business judgment and common sense are used in determining just how much money shall be spent on any station, it was said.

Sinclair leases do not contain an option to buy the station. Some of the leases are recorded but most of them are just filed at the company's own offices without recording, it was said.

Shell Petroleum Corp. uses a lease and contract of employment for dealers. Both flat and gallonage rentals are paid, it was said at the company's headquarters in St. Louis, but the gallonage rental form predominates. It pays usually ½ cent a gallon but in some parts of the south it is paying 1 cent a gallonage as are its competitors.

The Shell leases have 5 and 10-year terms but the lease is cancellable by Shell on 30 days' notice and payment of $10. The lease is not cancellable by the lessor.

Under the contract of employment the dealer may be removed on 30 days' notice or on immediate notice for cause. Among the causes for removal are drunkenness and possession of liquor.

Shell, it was said, when it leases a station, expects the station to be fully equipped for the sale of gasoline and motor oils. It does not expect to put in any more equipment, it was said. In Ohio, no free equipment has been put out since July, 1925, it was said, and the company has out few pumps except those that jobbing companies it has bought, had put out.

Shell paints leased dealers' stations in its company color and puts up its standard signs, it was said. No change has been made in its policy since the Chicago A.P.I. meeting, it was said.

Paragon Refining Co. has no definite rental price, it was said, but each leased station is taken as an individual case. The company, it was said, would like to arrange payment on a commission basis with a maximum of 2 cents off the tank wagon price, the usual discount granted wholesale accounts in Ohio.

Paragon leases call for a five-year term with cancellation by Paragon on 30 days' notice. Paragon will supply pumps and tanks but no other equipment, it was said.

All lease contracts contain a clause protecting the lessee companies against losses and damage claims which may result from operation of the business.

There has been considerable activity and disturbance in Maine in regard to the lease and agency agreement, according to Theodore E. Emery, Gardiner, president of the Maine Independent Oil Dealers Association. One large company that is entering the state has been most active in seeking leases of dealers' stations. Mr. Emery predicted the breaking down of the code if major companies persist in leasing dealers' stations because the larger Independent companies intend not to lose their business by means of the lease and agency plan.

Pennsylvania and Delaware distributors are not pushing the lease and agency agreement plan, according to R. A. Overholser, executive secretary of the Pennsylvania Oil Men's Association.

There has been some activity in leasing stations in Virginia, said A. L. Tenser, Jr., secretary of the Virginia Oil Men's Association. There have been charges of code violation and the payment of rebates but investigation in one case in which a major company complained to the state code committee against a small company showed there was no violation, Mr. Tenser said.

In the Carolinas there has been considerable switching of sources of supply by dealers but inquiries have failed to reveal just why or what terms are being offered.

The lease and agency agreement has not been generally adopted in Kentucky, according to L. J. Connelly, secretary of the Kentucky Petroleum Marketers Association. Marketers in the towns across the Ohio river from Cincinnati report a few have been made in that vicinity since the code went into effect and the commercial discount which had not previously been introduced into that territory, had appeared.

SOME of the large companies have been offering a form of lease and agency agreement in Tennessee but, according to L. W. Collins, executive secretary of the Tennessee Oil Men's Association, their aim evidently is to retain their large gallonage customers in cities and not to apply the contracts to small volume accounts elsewhere.

In Ohio a committee of the Ohio Petroleum Marketers Association has been working for a discontinuance of the oral promises given to obtain leases. On this committee are J. L. Marsh, Youngstown; W. F. Burke, Cincinnati, and Charles McLean, Cleveland. Recently Mr. Marsh and W. A. Milne, executive secretary of the association, called on marketing executives of some of the major companies that market in the state and were promised by most of them that promiscuous installation of equipment at leased stations would not be indulged in.

In Illinois the flat rental based on an estimate of gallonage is causing trouble.

"We know of many instances where estimated gallonage is entirely unreasonable as compared with the amount actually sold," said G. A. Primm, secretary-treasurer of the Illinois Petroleum Marketers Association. "We sincerely believe that the lease and agency agreements under which the major companies operate, are being abused."

The authorized agents agreement is being used in Wisconsin with no evidence of intention by the major companies to discontinue it, said H. A. Rhode, a member of the Wisconsin committee on interpretation of the code.

Independent marketers of Minnesota and North Dakota are becoming immune to the lease and agency agreement, according to Paul E. Hadlick, secretary of the Northwest Petroleum Association, who was secretary of the trade practice conference in St. Louis last February.

"The great objection I see in the lease and agency agreement is the estimation of the rent rather than putting it on a unit basis," said Mr. Hadlick. "If they made it ½ cent or even 1 cent a gallon rent, the amount that the dealer would get would not be a flexible slide rule in the hands of dealers.

"The lease and agency agreements, of course, are mere subterfuges for sales agreements, and outside of a few curb installations, everything up here is now going on the lease and agency proposition. A company taking a lease does not feel bound to collect the installation charge, and so we find that Rule 1 of the code means nothing.

"Perhaps I should not say that it really means nothing because it will stop a number of small installations at curbs, commercial accounts, chicken shacks, and what not."

There seems to be a let-up to the writing of lease and agency accounts in Missouri, finds George S. Allee, president of the Missouri Oil Men's Association. However, a few accounts have been taken from Independent distributors lately by means of the lease plan, particularly by one large Mid-Continent company which has not yet signed the code.

No complaints about alleged code violations have been received lately by the Oklahoma Oil Jobbers Association, according to Mrs. Vinnie Chaney, acting secretary.

In Nebraska the lease and agency plan is causing no trouble, according to C. M. Sutherland, secretary of the Nebraska Independent Oil Men's Association.

# Form for Agent's Agreement Used by Ohio Standard

IT IS HEREBY AGREED between THE STANDARD OIL COMPANY, an Ohio corporation, First Party, and ..... of ....., Ohio, Second Party, as follows:

1. Second Party shall act as the authorized agent for the First Party at a service station located at ..... ..... for the sale of First Party's gasoline, motor fuel, lubricants and petroleum products generally, said employment to continue so long as Second Party full-fills his agreements hereunder.

2. Second Party shall give his exclusive time and attention to said employment (except as hereinafter specified) and shall operate said service station in strict compliance with the rules and regulations of First Party in a manner satisfactory to First Party, and shall pay all operating expenses of said station out of his own funds, including light, heat and water bills, wages, repairs, replacements, and other operating expenses.

3. First Party shall carry in stock at said station such quantities of its products as may be necessary to supply the trade thereat, the title to all of which shall vest and remain in First Party until sold, and which Second Party is authorized to sell, but only for cash or upon credit as hereinafter set forth, for the account of First Party and at prices established by it, accounting and paying therefor (less his earned commission) at the time the supply of each product is replenished. However, in the case of package specialties, such as Sohio Liquid Gloss, Sohio Household Oil, etc., where stock may not be replenished often, settlement is to be made June 30th and December 31st, in addition to settlements made at the time stocks may have been replenished. Second Party may extend credit for products purchased, but only to persons whose names are furnished him in writing by First Party as entitled to credit, and then only to the extent authorized, and Second Party shall be personally responsible for payment in cash for credit sales to all other persons or beyond the authorized credit limit.

4. Second Party shall have the privilege of handling and dealing in ....., but only for his own account and risk and not as the agent of First Party, but shall not permit said business to interfere with his sales of the products of First Party or his duties under this agreement, and Second Party shall not handle, deal in, advertise or dispense from or upon said premises any petroleum products except those delivered to him by First Party.

5. As full consideration for the services, expenses and obligations of Second Party, First Party agrees to pay and Second Party agrees to accept commissions on all goods sold by Second Party at said station in accordance with the terms of this agreement, commissions on gasoline to be three cents (3c) per gallon and on motor oils, greases, specialty and other products to be an amount equal to the difference between the First Party's posted retail prices for such goods and its dealers' list price thereof at the time commissions are payable hereunder. All commissions on the sale of any product shall be paid at the time of replenishment of the Second Party's stock of such product. At the expiration of this agreement, or its termination for any cause whatsoever, Second Party shall make a complete accounting for all goods not previously accounted for, at which time all commissions then due shall be paid. Additional commisisons on motor oils and greases, based on the quantity sold, will be paid at the end of each six (6) months' period in the same amounts and upon the same terms and conditions as the additional quantity discounts then being allowed to First Party's dealers under such quantity discount arrangements as are then generally in force between First Party and its dealers. First Party's dealers' list price and/or First Party's posted service station price for any or all of its products are subject to change at any time by First Party.

6. Second Party shall be responsible for all loss or damage to goods furnished by First Party while in his possession as agent, and shall account for said goods as if sold.

7. The Second Party agrees for himself and for his heirs, executors and administrators, to exonerate, save harmless, protect and indemnify the First Party from and against any and all losses, damages, claims, suits or actions at law, or otherwise, judgments and costs which shall arise or grow out of any injury to persons (including Second Party and Second Party's employees) or property (including property of First Party, Second Party and Second Party's employees) caused by or resulting from the use of said station by the Second Party, or the conduct of the First Party's or the Second Party's business thereat.

8. This agreement is personal between First Party and Second Party and cannot be assigned by Second Party. Second Party shall have no authority to appoint any sub-agents nor to employ any one else on behalf of First Party.

9. It is understood that First Party holds the above service station under a lease and that this agreement, unless sooner terminated, shall terminate in any event with the termination of said lease for any cause.

Dated this ..... day of..... ....., 19.....

THE STANDARD OIL COMPANY,

By .....

First Party

.....

Second Party

## Pan American Building Refinery at Savannah

CLEVELAND, Dec. 28.—A 5000-barrel refinery is under construction by the Mexican Petroleum Corp. of Georgia, a subsidiary of the Pan American Petroleum and Transport group, on the Savannah River, about five miles above Savannah, according to T. S. Cooke, vice-president and general manager of manufacturing of the new company. The refinery is to be opened to take care of the needs of the parent company in the southeastern states.

The process units of the new plant will consist of two continuous pipe stills, with a combined capacity of 5000 barrels per day, and in addition suitable equipment of modern flash drums, bubble towers, tubular heat exchangers, and other accessory apparatus to equip an asphalt plant of the latest design.

From the Mexican crude will be derived in this plant processed gasoline, furnace oil, fuel oil and a complete line of asphalt products.

The site of the plant was selected to obtain both water and rail connections. The property has a river frontage of about 1000 feet and a depth of some 3700 feet to the southwest, about 100 acres of well-drained land being included in the area. A bulkhead built into the river, and dredging of the river bed in front of it, will enable ocean-going tankers drawing 30 feet of water to discharge crude cargoes.

The Savannah and Atlanta Railway has built a connection from their main line into the refinery. By this means contact will be secured with the Atlantic Coast line, Seaboard Air Line, Southern Ry., and the Georgia, Georgia and Florida, and Central of Georgia Railways. These connections will insure easy distribution of products to all points in the southeast.

A water pumping plant will be installed to furnish water for most of the needs of the plant from the Savannah river. Boiler water will be taken from wells already on the property.

The refinery units are being built by the engineering and refinery forces of the Pan American Petroleum and Transport, while tankage and gasoline storage is to be erected under contract.

# Political Action Urged to Cut Montana Gasoline Prices

CLEVELAND, Dec. 31

A MOVEMENT is underway in Montana to force down the retail price of gasoline by political means. A consumers' league has been formed and petitions are to be circulated among motor car owners asking that the governor take some action to investigate the reason for present prices in the state.

Similar efforts have been attempted in the past but have never reached the point of an investigation. Instigators in the past have usually been candidates for public office.

The price of gasoline in Montana is 28½ cents at the pump. The dealers' or retail margin is 3 cents, and the state tax 5 cents a gallon. The average freight haul from Montana refinery to Montana consuming points is said, on good authority, to average 3¾ cents a gallon bringing the net price laid down at destination in tank car lots to 16¾ cents.

Men affiliated with the oil industry in the state point out that 32 gravity crude costs $2 a barrel in the field and, as there are no cracking plants in the state, the fuel residue brings only 40 to 60 cents a barrel. Gasoline, the only product to have a ready sale, must carry the cost of processing and distribution.

Distributing costs are relatively high because of the sparsity of the population as compared with states in the middle west, east, and Pacific coast and it is a necessity to make a relatively small gallonage carry a relatively high operating cost. The nature of the terrain also adds to distribution costs, it is pointed out.

In the following article published in the Great Falls, Mont., *Tribune* the allegations of the consumers association are set forth with prices in other cities in the country.

"BOZEMAN, Dec. 21.—Charging that auto owners in Montana pay at least 5 cents more a gallon for gasoline than is paid in neighboring states, the recently founded Montana Gasoline Consumers association is rushing work on its campaign to force an investigation into refiners' prices in the state.

"Petitions are being mailed to all cities in the state for signing by auto owners before being forwarded to Gov. J. E. Erickson. The petitions ask for an official investigation to determine reasons for high prices in Montana.

"Most of the 300 petitions to be distributed have been sent, according to W. J. Peete, local filling station owner and manager of the campaign. With the petitions, letters are being sent which ask assistance of all auto owners in forcing "refiners to give the consumers a square deal."

"The letter says it is believed refiners will make some reduction to head off the investigation but that the association will not stop its work until just prices for auto fuel have been assured in the state.

"How much of the summer tourist trade is kept out of Montana because of the exorbitant prices charged for gasoline in the state is hard to estimate, according to Mr. Peete but it is known that the word has been passed among tourists to 'stay out of Montana; their gasoline prices are out of reason.'

"The campaign will follow general lines of one recently started in Wyoming, where residents found prices were higher than those charged in other states where gasoline manufactured in Wyoming was sold.

"Mr. Peete says Montana manufactures at least 60 per cent of its own gasoline and is paying an exorbitant rate for it, not because retailers are raising prices nor because of the state tax, which goes to build roads, but because of exorbitant prices being asked by refiners.

"A schedule of prices included with petitions shows that the current price at Bozeman and other places in Montana of 28½ cents a gallon is from 5 to 10½ cents higher than in comparative cities.

"Atlantic coast prices, including tax, vary, according to the rate card, from 18 to 21 cents; Denver and Salt Lake, 21 cents; Los Angeles, 20 cents; Casper, Wyo., 23; Portland, Ore., and Seattle, 23½ cents.

"The association had its origin at Bozeman and the executive committee is composed of some of the leading business men of the city.

"Fred B. Williams, recently named president of the chamber of commerce, is chairman, and other members are W. S. Davidson, A. G. Berthot, Dean Chaffin and Charles Vandenhook. Officers of the association are:

"Manager, W. J. Peete; Mr. Vandenhook, treasurer, and Roy M. Keister, attorney.

"Indorsement of the association and its work has been given by the chamber of commerce, Rotary and Kiwanis clubs, Gallatin Automotive Distributors association and the Montana Automobile Distributors."

## Plan Revived to Safeguard Naval Oil Reserves

By Telegraph

WASHINGTON, Dec. 30.—At the request of Secretary of the Navy Adams, Chairman Britten of the House Navy Affairs Committee, has revived, in the form of a bill, the plan for enabling the Navy department to handle its petroleum and oil shale reserves in such a manner as to keep them worthy of being called reserves.

The new bill, which takes the place of the one introduced two years ago, authorizes the Secretary of the Navy to trade government lands outside of the reserve for lands within the reserves that are held by private citizens and to make contracts for unit development of lands adjoining those in the reserves so as to save the government the expense of offset wells.

The new measure also makes citizens of countries that do not permit the exploration and exploitation of their oil lands by Americans ineligible to obtain any interest, direct or indirect, in any of the reserve lands that may be leased or exchanged, so as to prevent depletion of the remainder of any reserve.

The bill is intended particularly for the preservation of the Elk Hills reserve in California by making it possible for the Navy to trade lands in the Buena Vista Reserve to holders of lands within the boundaries of the Elk Hills Reserve. Thereby the Navy hopes to turn Elk Hills into a real reserve, by the removal from it, of private holders of lands within its boundaries.

## Denies Infringement In Ethyl Manufacture

(By Telegraph)

TULSA, Dec. 31.—Several refiners in the Mid-Continent blending and selling Ethyl gasoline have received letters from E. W. Webb, president of the Ethyl Gasoline Corp., New York, stating that his attention has been called to warnings being sent to refiners by the General Research Corp., of Denver.

These warnings state that the use of tetra ethyl lead made under processes covered by patents of this concern is unlawful unless accompanied by proper license.

Mr. Webb stated in his letters to refiners that this concern has also started suit against the Ethyl Gasoline Corp. at Omaha, contending that it had some kind of an oral agreement with the Ethyl corporation concerning the manufacture of tetra ethyl lead.

Mr. Webb has called the refiners' attention to a clause in contracts of his company with refiners by which the Ethyl Gasoline Corp. protects other parties to the contract against such claims. Mr. Webb has stated his company is not violating or infringing the rights of any other concern or individual in selling Ethyl fluid.

# Increases in Rail Rates in Southwest Proposed by I. C. C. Examiners

By A. E. Heiss
N. P. N. STAFF WRITER

WASHINGTON, Dec. 30

A GENERAL overhauling and increasing of railroad freight rates on petroleum products in southwestern territory, and from that territory into northeastern and southeastern parts of the country, has been proposed to the Interstate Commerce Commission by Examiners Philip S. Peyser and Burton Fuller.

Their reports, which were filed with the commission Dec. 28, are based on testimony the two examiners have been taking the past year and more in the cases originated by the commission as a result of the Hoch-Smith resolution adopted by congress in 1925. The purpose of this resolution was to have the commission determine if freight rates of all kinds and classes could not be rearranged to give preference to agricultural products as a form of farm relief.

While it is too early yet to determine in detail the effect of the new rates on petroleum products suggested in the examiners' report, it seems likely that, if adopted, they would tend to change considerably refinery marketing territories as now set up.

The commission is allowing until Feb. 10 for the filing of objections to its proposals. Answers to the objections, which would naturally come from those oil companies and carriers which would be benefited by the adoption of the recommendations of the examiners, are to be filed not later than March 1. Arguments on the proposals are to be made in Washington March 5.

**Mileage Scale Based on Two Zones**

The examiners recommend increases in rates on oil, although they report that the roads are able to transport oil traffic at 60 per cent of what it would cost if the roads owned the tank cars now furnished by the oil companies. They propose the destruction of the present rate in the southwest and substitution of higher rates, except in some parts of Texas.

The examiners recommend that the rate body force the railroads to make an increase in their rates from the southwest via Kansas City and St. Louis—using those gateways as typical—of 1.5 cents per 100 pounds. The examiners found that the failure of the railroads to take the full measure of increases allowed in the case known as Mid-Continent Rates, 1925, resulted in undue prejudice against the refiners in central territory (between the Mississippi and a line drawn through Buffalo and Pittsburgh north of the Ohio river) and an undue preference for the refiners in the southwest.

That is the recommendation, which, if adopted, probably would have the most profound effect, economically, on the marketing of the products of the refiners in the Mid-Continent to the south thereof. What the Mid-Continent refiners have been saying for years as to their economic troubles, seemingly, did not overbalance, in the minds of the examiners, what was said by refiners east of the Mississippi.

In addition to proposing to force the southwestern railroads to take an increase in rates to the northeast through the Kansas City and St. Louis gateways, the examiners proposed to divide the southwestern territory into two zones, A and B, with a mileage scale to be used in making rates, those in Zone B to be on a higher level than those in Zone A.

The last mentioned zone is that part of the southwest lying north and east of a line beginning at Superior, Neb. running to Galveston, Tex., via Abilene, Salina, Hutchinson, Geneseo and Anthony, Kans., thence through Sweetwater, Texas to Galveston. The rest of the southwestern territory is to constitute Zone B. Southwestern territory is that which lies west and south of the Missouri river and the middle of Kansas, roughly speaking.

**Specific Rate Changes**

The Zone A scale begins with a rate of 10 cents per 100 pounds for the minimum distances of 10 miles, to 100 miles, goes to 19 cents at 100 miles, 28 cents at 300 miles, 35 cents at 500 miles, 45 cents at 500 miles, 42 cents at 800 miles and runs out with a rate of 47 cents for the 30-mile block between 970 and 1000 miles.

The Zone B scale begins with 11 cents per 100 pounds at the minimum distance, runs to 20 cents at 100 miles, 31 cents at 300 miles, 39 cents at 500 miles, 50 cents at 800 miles and runs out with a rate of 56 cents for between 970 and 1000 miles.

The box car rate begins with 12 cents for the minimum distance, goes to 21 cents at 100 miles, 35 cents at 300 miles, 43 cents at 500 miles, 53 cents at 800 miles and runs out with a rate of 60 cents for the 20-mile block between 980 and 1000 miles.

Broadly speaking, the examiners propose an increase of 1.5 cents per 100 pounds from typical points of origin in the southwestern territory to crossings and gateways particularly Kansas City and St. Louis, so as to bring about a rate situation more favorable to refiners east of the Mississippi.

Such an addition is not made to all crossings and gateways from all points but that is the general rule. To illustrate, a rate of 18.5 cents from Eldorado and Coffeyville, Kans. to Kansas City is to be increased to 20 cents and a rate of 30 cents from those points to St. Louis is to go up to 31.5 cents. The rate of 25.5 from Tulsa, Enid, Armore and Grandfield, Okla. to Kansas City is to go to 27 cents and a rate of 30 cents from those points to St. Louis is to go to 31.5 cents.

**Refine "High Grade" Products**

The examiners, in their reports, propose that the rate on high grade products shall constitute the standard and that rates on crude and low grade products shall be 80 per cent of the rates on refined products. They propose that the rate regulating body shall define the two classes as follows:

"The so-called high grade refined petroleum products included in this investigation consist of the distilled products of crude oil, when the latter is heated to a temperature not exceeding 450 degrees F., and the residuum at 450 degrees or lower temperature, when further processed or treated (other than mere separation by distillation or otherwise.)"

The average haul of oil is somewhat less than 300 miles but, for the purpose of getting a general idea as to what the proposed changes would do in the scales for intrastate commerce, it may be mentioned that the rate of 28 cents proposed by the examiners for that distance would cause increases from the following rates in the states indicated: Kansas, 21.5 cents; Louisiana, 22 cents, and Missouri, 27.5 cents. The Texas intrastate rate would be pulled down from 39.5 cents to 28 cents for the haul of 300 miles. The Oklahoma and Arkansas single-line scales, the only sort here used, are the same as the

Kansas rates. Rates for movement over two or more lines of railroads are from half to 5.5 cents per 100 pounds higher.

The report shows that the southwestern railroads, which refused to take as high rates to the Kansas City and St. Louis gateways as permitted by the decision in Mid-Continent Rates, 1925, were hostile to the implication that, on account of a depression in agriculture in 1925 when the Hoch-Smith resolution was passed, they should raise the rates on petroleum.

**Roads Refuse to Advance Rates**

When they complied with the Interstate Commerce Commission's order to submit proposed rates, they suggested that oil rates be made on the basis of 30 per cent of the first class rates prescribed in the Consolidated Southwestern Case, decided by the Commission in 1927. That meant that, if the first class rate for 300 miles was $1, the oil rate for that distance would be 30 cents.

But the first class rate in the southwest is higher than that. It is so high that the proposal of the railroads figure out 40 cents per 100 pounds for 300 miles, or half a cent higher than the very high Texas intrastate rate for that distance. Apparently they proposed rates on that high level so as to make their proposals obnoxious to the commission and the shippers.

"There is evidence tending to show that the carriers' proposal would encourage short haul movements by truck and the building of small refineries throughout the territory, thus reducing the volume of movement and average haul of refined oil by rail," said the examiners commenting on the proposal of the railroads.

"The carriers operating in the southwest have hitherto cooperated with the industries in an effort to keep the traffic within the southwest on their rails. Their proposal in this proceeding, therefore, represents a startling reversal of policy."

Shippers made counter proposals, the proposition of the Sinclair Refining Co., for instance, being a scale on the basis of 17.5 cents of the Consolidated Southwestern scale. That company said that adoption of the proposal of the railroads would increase its freight bill, largely in Kansas, by 55 per cent.

Another portion of the report pertained to rates from southwestern refining points and refining points in the Mississippi valley territory, such as from Baton Rouge and New Orleans to the lower Mississippi River crossings, that is to those below Cairo, Ill., to destinations in the Mississippi Valley territory, which is a slender pie shaped region with its point at Cairo, Ill. and its widest part from New Orleans over to Pensacola, Fla.

The examiners said the rates in that part of the country should reflect the changes proposed in southwestern territory.

Each of the two proceedings had attached to it about 100 cases brought by refiners and marketers of petroleum. The examiners made recommendations as to particular rate situations in each of them. They are so detailed that not even general descriptions could be given without rivalling Wells' Outline of History.

The rates in the southwest and across the Mississippi River generally have been in such a ragged condition that complaints in the last few years, from the oil industry, in volume have been much greater than from any other industry. They constitute about one-sixth of all the business before the Interstate Commerce Commission.

## Inventor of Colorimeter, T. D. Simpson, Dies

PHILADELPHIA, Dec. 28.—Thomas D. Simpson, 44, of the Tiona Petroleum Co., died Dec. 19. Death was caused by a carbuncle in his nose which resulted in blood poisoning.

Mr. Simpson, a chemist of note, was inventor of the present National Petroleum Association and A.S.T.M. color machine, and was said to be one of the first men in this country to use soaps in connection with oils to eliminate chatter in Ford automobiles.

He was associated with the oil industry all his life. For many years he was with the Union Petroleum Co. About a year after the incorporation of the Tiona Petroleum Co., he left the Sinclair Refining Co. and managed a specialty department for Tiona.

Mr. Simpson is survived by his widow and two daughters, 11 and 13 years old. He was born in Marcus Hook, Pa., in 1885, and resided for the past few years in Chester, Pa.

## Head of Freedom Oil Works, P. L. Craig, Dies

FREEDOM, Pa., Dec. 28.—Percy L. Craig, 61, president of the Freedom Oil Works, died Dec. 17 at Clifton Springs, N. Y., where he has been for three months in an effort to regain his health.

Mr. Craig managed various natural gas companies, beginning in 1886. These companies were merged later with the Fort Pitt Natural Gas Co, of Pittsburgh, of which he was vice-president and general manager until the company was sold in 1903 to the Manufacturers Light & Heat Co.

In 1911 Mr. Craig became treasurer of the Freedom Oil Works. The next year he succeeded his brother, the late Joseph W. Craig, as president of Freedom.

Mr. Craig was born in Alleghany, now part of Pittsburgh, in 1868. He is survived by his widow, one son, Earl Craig of Freedom, and a daughter, Mrs. James S. Weaver, Maplewood, N. J.

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TULSA—F. Van Acker, formerly chief engineer for the Engineering, Research and Equipment Co. at Dallas, is now chief engineer for Petroleum Engineering, Inc., with offices in the Philtower Bldg., Tulsa.

## American Petroleum Institute report on refinery operations in the United States for the week ended Dec. 21, compared with the week ended Dec. 14

| Districts | Per Cent of Capacity Reporting | Daily Av. Crude Run to Stills Wk. Ended 12-21 (Barrels) | Daily Av. Crude Run to Stills Wk. Ended 12-14 (Barrels) | Per Cent of Reporting Capacity Operated Wk. Ended 12-21 | Per Cent of Reporting Capacity Operated Wk. Ended 12-14 | Stocks Reported in Thousands of Barrels: Gasoline Stocks Dec. 21 | Gasoline Stocks Dec. 14 | Gas & Fuel Oil Stocks Dec. 21 | Gas & Fuel Oil Stocks Dec. 14 |
|---|---|---|---|---|---|---|---|---|---|
| East Coast | 100.0 | 471,200 | 459,100 | 77.8 | 75.8 | 5,705 | 5,260 | 7,800 | 7,934 |
| Appalachian | 91.2 | 86,700 | 78,800 | 74.2 | 67.6 | 1,183 | 1,109 | 814 | 820 |
| Ind.-Ill.-Ky | 98.6 | 296,500 | 308,800 | 83.5 | 87.0 | 4,888 | 4,512 | 3,531 | 3,527 |
| Okla.-Kan.-Mo | 88.6 | 288,300 | 294,900 | 70.4 | 72.0 | 3,242 | 2,999 | 3,459 | 3,466 |
| Texas | 90.7 | 547,800 | 539,100 | 77.9 | 77.0 | 6,526 | 6,409 | 14,029 | 13,715 |
| La.-Ark | 95.5 | 201,900 | 193,200 | 70.3 | 67.6 | 1,902 | 1,959 | 4,821 | 4,764 |
| Rocky Mountain | 92.9 | 59,200 | 68,700 | 42.8 | 49.6 | 2,091 | 1,996 | 977 | 987 |
| California | 99.3 | 630,400 | 635,800 | 70.7 | 71.3 | 14,914 | 14,814 | 109,252 | 109,002 |
| Total U. S. | 95.3 | 2,582,000 | 2,578,400 | 73.6 | 73.6 | 40,451 | 39,058 | 144,683 | 144,215 |
| Texas (Gulf Coast) | 100.0 | 437,100 | 428,000 | 83.0 | 81.8 | 5,556 | 5,439 | 10,020 | 10,753 |
| La. (Gulf Coast) | 100.0 | 147,500 | 136,800 | 83.1 | 77.1 | 1,631 | 1,714 | 4,000 | 4,025 |

# Program for Calibrating Test Apparatus Should Have Industry's Cooperation

By Arch L. Foster
N. P. N. STAFF WRITER

CLEVELAND, Dec. 30

THE recent announcement of the preparation and standardization of test oils for the calibration of Saybolt Universal and Furol viscosimeter tubes, by Dr. T. G. Delbridge of the Atlantic Refining Co. in cooperation with the U. S. Bureau of Standards, initiates a movement which should receive the commendation and hearty cooperation of every oil company and laboratory supervisor in the country.

The crying need for this type of calibration facilities has been felt by testing and control laboratories since the advent of general testing methods into the oil refining industry. This, however, is the first concerted attempt by the industry to provide dependable means whereby apparatus in common use by all testing agencies may be calibrated with exactness and with a common unvarying standard.

For many years the Bureau of Standards has maintained a special laboratory for the standardization and calibration of test apparatus of every sort, including thermometers and temperature indicating and recording devices; viscosimeters and other oil testing equipment which are of a type to permit reasonably easy and definitely accurate calibration; as well as other apparatus in every industry interested in accurate and dependable test apparatus and methods.

This service has been extended to any and all who had need for it, at very nominal charges to cover a part of the expense incident to the work done. The Bureau of Mines has also cooperated in every way with refiners and producers on innumerable problems where calibration and standardization of apparatus, in any type of problem was needed, or where it was considered such results would aid the final solution of the difficulty.

In most cases, however, the service offered, and the work done has been an individual proposition. In order to be certain that his thermometers, viscosimeters, or other apparatus were giving correct results the oil company must send these instruments to Washington to be calibrated against the master instruments at the Bureau of Standards.

This requires time, some expense, and the loss of the use of the instruments while they are being tested. Also, instruments in constant use by even the best laboratory chemists and testers change during that use. Wear and tear increase the diameter of the bore of viscosimeter tubes. Heating and cooling induces stresses in thermometric equipment which throws it off standard.

So, in order to keep its apparatus up to standard, the oil company must repeat the calibration more or less frequently, with the consequent expense and inconvenience. This must be done by either comparing with the standards at Washington, or, less satisfactorily, by comparison with carefully calibrated instruments kept in the individual laboratory. Either way is inconvenient and not wholly satisfactory.

To remove this difficulty and to provide an easy, simple and dependable method whereby the individual oil company laboratory, however small, may check up on the results obtained with the instruments employed, as a part of the regular routine, Dr. Delbridge has prepared carefully chosen samples of two oils to be used as standard calibrating oils for viscosimeters. These oils are being tested in the master saybolt viscosimeter tubes at the Bureau of Standards, Washington, and also against the special tube purchased for the purpose and held in the Bureau laboratory. A large quantity of each oil has been prepared, sufficient to furnish the necessary sample to every laboratory in the country. One sample is to be used to calibrate the standard Saybolt Universal tube at 100 degrees F., the other for the same tube at 210 degrees F., as well as the Saybolt Furol tube, used to determine the viscosities of fuel and similar oils at 122 degrees F.

When the standardization of these two oils is complete, samples may be

## Will Lessen Commercial Disputes

THE project originating with Dr. T. G. Delbridge, of the Atlantic Refining Co., for providing a means by which testing apparatus in oil company laboratories over the country may be standardized and calibrated, NATIONAL PETROLEUM NEWS believes should have the support of oil chemists and executives throughout the industry.

The project of Dr. Delbridge, explained in detail in the accompanying article, is to provide, for any interested laboratory, test oils for the calibration of viscosimeter tubes. By this means viscosimeter apparatus may be checked as a part of laboratory routine to insure that the viscosity determinations are accurate.

The project so far announced should be only a start in this work. The same means of standardization can well be applied to a large portion of laboratory apparatus used in oil testing. The practical value to the oil companies of this work will come through the elimination of commercial disputes over quality of shipments, which disputes, in many cases, arise through discrepancies in test results through the use of unstandardized or improperly calibrated apparatus.

This work, if carried out as it should be, is a more arduous task than one man should be called upon to assume responsibility for. We believe it should receive immediately the consideration of the oil industry associations. There is published, at the end of the accompanying article, one letter from an interested chemist discussing this project. NATIONAL PETROLEUM NEWS will be glad to publish more comment on this subject.

obtained from either Dr. Delbridge of the Atlantic Refining Co. or the Bureau of Standards. A nominal sum will be charged for the samples to defray the actual expense of preparing them.

That the originator of the movement has no intention of letting the project die with this one effort is indicated by his announcement that the funds derived from the sale of these samples will be utilized to carry the scheme further in applying it to the standardization of other test apparatus and methods in general use in oil laboratories. The advantages of such a plan, properly developed and carried out with the cooperation of those who will be most benefited, can hardly be estimated.

Hardly an oil company today but has been a party to a dispute over the inspection results of a shipment of refined petroleum products. A tank of gasoline, or fuel oil, or a consignment of asphalt, paraffin wax, or cylinder oil is reported by the purchaser's laboratory as failing to meet specifications in one or more points. End point may be reported too high, or viscosity, penetration, melting point or pour points are too high or too low and the consignment is rejected.

The refiner's inspection showed that the shipment met all the agreed-upon specifications. Loss of time, money, confidence and sometimes severance of business relations profitable to both ensue, when, in many cases, the difficulty probably lies in improperly calibrated or standardized equipment or methods of determination in one or both laboratories. Without doubt such occurrences can be practically eliminated by such a plan as the one described above, whereby the results of tests in any laboratory are brought into practical agreement with similar results from all others.

As is thoroughly well known, one of the greatest difficulties encountered with many of the test methods now used in oil laboratories is the inability to reproduce in one plant the results obtained in another, using the same apparatus so far as is practicable. It is generally acknowledged that the copper dish method for gum determination in motor fuels is unsatisfactory and should be replaced by a more dependable method. One objection to the copper dish is that the results are not directly related to the gum forming tendencies of the fuel in use. It has also been demonstrated that the results of this testing method are not reproducible in different laboratories with a sufficient degree of accuracy.

Similar difficulties have been encountered all along with the standard distillation test, the various methods for rating detonation tendencies, oxidation test methods and apparatus, emulsion tests and others. The Sligh oxidation test showed a grave lack of reproducibility when its standardization was first undertaken, although this objection has been in great measure removed as the result of several years of careful work and study by those interested in the problem.

Nor can it be expected that all these troubles will be eliminated merely by the standardization of operating procedures, or the calibration of the instruments employed. The problem is not so simple as that. As the work is carried on, some of the methods in use at present will be shown to be inherently incapable of yielding dependable, reproducible data. In that case new tests must be developed which will give more accurately the data needed. But certainly the advantages to be derived from calibration and standardization of the tests and test apparatus now in use which have shown serviceability cannot be overlooked, nor can we afford to fail to "get together" when such an opportunity offers to push matters towards a more satisfactory conclusion.

Some of these difficulties on test methods are of such immediate importance that concerted effort has been and is being made to work out

# Method for Procedure Is Suggested

By C. Simnett, Chemist, E. W. Saybolt & Co.

IN THE Dec. 18th issue Dr. T. G. Delbridge has taken steps toward a long sought for solution of the calibration of viscosimeters in a general way, there can be little doubt but that all refiners will avail themselves of the opportunity of receiving these standard samples for the purpose of controlling uniformity of determined viscosities.

A step further along the ideas of Dr. Delbridge could possibly be taken whereby all chemists engaged in the testing of petroleum products would be able to participate in a more collaborative manner.

In order to have a collaborative scheme function properly the participating chemist must first welcome the idea and then follow this through with continued eagerness to carry out the tests as required, reporting promptly and waiting to see the results of his fellow collaborators.

The whole scheme is not a competitive one, on the contrary you assist your fellow collaborator in obtaining results in accordance with others and all around is the prevailing feeling of assurance.

To start the scheme from the bottom upward we would first secure the names of those chemists participating, they would be identified thereafter by a number only, the reason for this would be to simplify matters and when the results of all the tests were presented and published they would be reported under the number given the participant.

The samples submitted for this kind of work would be distributed at regular intervals say every three months or more frequently. The grades of materials and number of samples submitted to each chemist would vary from time to time, and the tests required would be governed by the nature of the material and the methods would be those of standard procedures.

In the preparation of the material for distribution a thorough mixing, carefully bottling and samples sealed would be all that is necessary, a previous test of the material would be eliminated as the accepted average of all tests submitted would be reasonably close enough.

To stop at the viscosity test would appear to be premature. With the value of other tests set aside. why not incorporate all tests usually required? For instance a turbine oil for the emulsion tests, compounded cylinder oils for animal fat content, compounded marine oil for vegetable oil content, complete grease analysis, etc., along with all other tests usually required.

There is much to be learned in such a collaborative scheme extending to chemists throughout the country. Difficulties may arise causing irregular results; these difficulties can be smoothed over by the proper cooperation with your fellow collaborators without the necessity of identification beyond your number unless otherwise desired.

In large industries where many laboratories are scattered throughout the head laboratory submits samples to the branches for the purpose of insuring concordant results in all tests; this system meets with much success and is found necessary.

In conclusion, the formation of such a group of petroleum chemists to carry out this special work would be well worth while. The Cotton Seed Crushers Association have carried out a similar scheme, meeting with great success, this association submitted samples of cottonseed oils for physical tests such as refining losses, etc., bleaching properties of earths, cottonseed meal, etc. each chemist is identified by a number, the results of all the tests are forwarded him only.

suitable standard equipment and procedures. When a committee was appointed to formulate and try out a dependable method for the determination of knocking properties of gasolines, it decided that the first thing to be done was to design an engine by which operating conditions could be controlled and reproduced by different operators with a minimum of variation. The first batch of the new engines has been distributed to cooperating agencies, and the preliminary work of developing the method is just getting under way. Many other problems are receiving intensive study by Committee D-2 of the American Society for Testing Materials and other organizations.

The Society of Automotive Engineers recently formulated a system of viscosity numbers, by which lubricants for internal combustion engines may be compared, no matter from what source they are derived. By this plan the ultimate consumer may be assured of obtaining oils of the same viscosity at a representative working temperature in any locality when purchasing by the so-called S.A.E. number representing the "grade" or viscosity he wishes to use. The advantage of such a scheme is obvious.

Until the announcement of the plan for calibrating viscosimeters by means of standard test oils was made, no concerted effort toward a cooperative arrangement for accomplishing this and similarly profitable results has been made. Probably the best manner of furthering work of this kind is by placing the carrying out of the effort under the supervision of some collaborative organization interested in perfecting laboratory test methods, such as the American Society for Testing Materials.

If that route is not a feasible one, an organization of interested refiners, who would collaborate in obtaining data and in the selection of vehicles for each purpose desired, would simplify matters and take a considerable load off the shoulders of one man, the originator of, and present sponsor for the scheme. The distribution of samples of materials, collaboration in taking and comparing test data, dissemination of the results of the work carried out, and the furnishing of standardized test and calibration materials could be handled more easily, and with better results probably, than if the work is left to be managed by one or two men. While these individuals are thoroughly capable, their present duties would doubtless prevent their giving to the job the amount of time and effort necessary to obtain the maximum of profit to all concerned.

NATIONAL PETROLEUM NEWS is anxious to present to its readers the ideas and suggestions of all who wish to discuss this subject, and invites those interested to write in their comments and opinions on the value of the results that this scheme should provide, and suggestions as to how the work may be aided and extended. The following letter has been received from C. Simnett, chemist with the E. W. Saybolt & Co., and is included in full here as an instance of one man's ideas and opinions:

# Tentative Test Methods For Density Balance

Staff Special

TULSA, Dec. 28

TEST procedure methods for the recently adopted gas density balance for determining the specific gravity of gases have been published by the Natural Gasoline Association of America, following their adoption by the board of directors as a tentative standard for a period of one year, beginning Jan. 1, 1930. Unless some change should be found necessary the methods will become standard effective Jan. 1, 1931.

The test methods were drafted by the gas testing committee of the association after the balance was given thorough tests in the field and was demonstrated by S. F. Pickering, associate chemist of the U. S. Bureau of Standards, who had been assigned to the problem of finding a balance which the Bureau could recommend and approve.

Mr. Pickering in his experimental work examined several types of balances and finally decided on an Ac-Me balance as the one in which the new type of suspension fitted best. The balance adopted by the association is a modified type of that balance. The primary difference is in the type of suspension, the approved balance being a modified Cardan principle using four phosphor bronze springs instead of the two strips in the Ac-Me balance.

The patent covering gas gravity balance with suspension spring method was issued to W. A. Schlueter and assigned to The Refinery Supply Co. under serial No. 1649746, and is the basic patent on "spring suspension methods."

Mr. Schleuter, who is president of the Refinery Supply Co., has cooperated with the committee and association board, and has announced that, in order to conform to any specifications the committee may desire, he will rebuild any of the present Ac-Me balances at a reasonable cost, at the same time expecting full protection on the company's patent.

While the four-spring type was declared to be more rigid than the two spring type, Mr. Schleuter has stated that more than 300 balances made by the old Ac-Me and the Refinery Supply Companies have been in satisfactory use for several years in this and foreign countries.

The test procedure method and description of apparatus as published by the association carries the following foreword:

"The specific gravity of gases shall be determined by means of a gas balance constructed, as to principle, similar to the Edwards gravity balance described in Technologic Paper No. 89, United States Bureau of Standards. This principle embodies Boyle's Law which prescribes that the density of a gas at constant temperature is proportional to its pressure; or restating the law as quoted in the technologic paper referred to, 'the densities of two gases at normal pressure are in inverse ratio to the pressures when of equal buoyant force.'"

A vote of thanks has been given by the gas testing committee of the Natural Gasoline Association of America to E. A. Clark and B. L. Maulsby of the Oklahoma Natural Gas Corp., for the tremendous amount of research work, and field and laboratory experimentations conducted in connection with the U. S. Bureau of Standard's work in developing an approved gas gravity balance. Messrs. Clark and Maulsby volunteered their services and the results of their work were given to S. F. Pickering of the Bureau. He reports that their efforts were of great assistance to him.

The description of the auxiliary equipment, and the complete outline of the test procedure can be secured through the Natural Gasoline Association, 305 Tulsa Bldg., Tulsa. The balance was described in NATIONAL PETROLEUM NEWS, Dec. 18, Page 33.

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ALLEGANY, N. Y.—A course in petroleum chemistry will be offered at St. Bonaventure College at the opening of the second semester in January.

Oil companies of the Pennsylvania field have been cooperating in establishing the course. It will be open to members of the technical staffs of these companies.

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**Tide Water Adopts Stock Plan**

NEW YORK, Dec. 28.—Directors of the Tide Water Associated Oil Co. have approved an employes' stock purchase plan. For a three-year period, employes may buy up to 10 per cent of their anunal salaries or wages at prices to be established annually by the directors.

# Serviceability of Aluminum Tanks For Trucks Is Demonstrated

CLEVELAND, Dec. 31

THE practicability of aluminum alloy as a material for the construction of tanks for gasoline delivery trucks was proved to the satisfaction of automotive, oil company and equipment engineers in tests of aluminum tank compartments held recently at the Cincinnati factory of the Davis Welding & Mfg. Co. under the auspices of the Davis company and the Aluminum Co. of America, Pittsburgh.

Six 150-gallon truck tank compartments were used in the tests. These tanks were fabricated by the Davis company from the Aluminum company's 3S half hard sheets in the shell and 3S hard sheets in the heads.

Two weights of construction were used. Three tanks were made with shells 0.109-inch thick and heads 0.141-inch thick. Three others had 0.156-inch shells and 0.204-inch heads. The ovals were 34 by 46 inches. The sheets in the lighter weight tanks were comparable in gauge with the sheets in steel tanks of the same capacity; but the heavier aluminum sheets, used in the second group of tanks will probably be the gauge of metal to be used in tanks built for active service.

The compartment heads had rolled flanges of the same type Davis builds into steel truck tanks. The flanges were butt welded to the wrapper sheet. This type of head was used to remove the weld as far as possible from the root of the flange because the weld naturally is cast aluminum which has less tensile strength than the wrought aluminum of which the sheets are made. The ends of the wrapper sheet were butt welded.

Lapwelding was not recommended for aluminum because, it was said, of a tendency of the flux to remain between the sheets. When the flux becomes wet a corrosive action is set up.

The manhole cover and fittings were aluminum cast of the Aluminum company's No. 43 alloy.

The tests were drop, hydrostatic and fire. One of the lighter tanks was filled with water, hoisted 10 feet and dropped to a ½-inch steel plate set on a surfaced concrete floor. The tank was distorted but did not rupture.

Then a heavy tank was filled with water and dropped 10 feet. The distortion was less and it likewise did not suffer a rupture.

A second heavy weight tank was filled with water and dropped 25 feet. There was considerable distortion of this tank but no leak developed. The drop test in the severe New York City tank specifications calls for only a 4-foot fall and in the New York City tests bolsters and sills are attached to the tank helping to strengthen it. In the tests at the Davis factory there was no supporting equipment.

*Just before the drop. A 150-gallon heavy weight aluminum tank compartment filled with water, a moment before it fell 25 feet without developing a leak*

A light weight aluminum tank was used in the fire test. A steel supporting frame had been built in a vacant lot near the Davis plant and the tank was placed on this with the bottom of the tank about a foot off the ground. Steel shields were placed about the pyre so the flames would be forced around the tank. A further guard against wind blowing the column of hot gases away from the tank was a steel windshield several feet to the windward of the pyre.

Oil soaked wood was placed under the tank and a small pipe line for kerosene was arranged so that kerosene could be sprayed on the fire to keep it burning briskly.

Then 75 gallons of gasoline were poured into the tank, the manhole with screened vent set, and the fire ignited. The fire burned for 38 minutes, but the gasoline was consumed in about 34 minutes, the vapors burning as they escaped through the vent. After the gasoline had been boiled out, the bottom of the tank melted. However, the heat was so intense that a small fissure developed in the top of the tank where there was less chance for liquid gasoline to act as a cooling agent. This fissure caused a reduction in the pressure within the tank, a diminution in the size of the column of fire from the vent indicated.

At one time the column of burning gasoline vapors rose 25 or 30 feet above the vent.

"Doubtless the gasoline in this test burned much faster than if a steel tank had been used in the test, due to the greater heat conductivity of the aluminum," said Augustine Davis, Jr., president of the Davis company.

Pictures were taken at frequent intervals during the fire and these seem to indicate, Mr. Davis said, that the fissure came when the liquid level in the tank became low and a considerable pressure developed when the top of the tank was at a great heat.

An engineer of the Standard Oil Co. of New Jersey, who was present, said he had witnessed four fire tests, but this one was the most severe and

*Aluminum alloy truck tank compartments used in the drop and fire tests at the Davis Welding & Mfg. Co. plant recently in Cincinnati. The tank at the extreme right was the one used in the fire test. Data concerning each particular test were painted on the tanks after each test was completed. Most of the witnesses remainded for this picture, left to right: W. E. Reynolds, Aluminum Co. of America; L. Duerr, Davis Welding & Mfg. Co.; E. W. Schutte, Davis Welding & Mfg. Co.; C. L. Brand, Davis Welding & Mfg. Co.; F. D. Goll, Aluminum Co. of America; W. E. Fletcher, Freuhauf Trailer Co.; G. R. Gwynne, White Co.; P. C. Nordloh, Procter & Collier Co.; H. L. Lowry, Davis Welding & Mfg. Co.; S. A. White, National Refining Co.; H. K. Reilly, Davis Welding & Mfg. Co.; R. P. Hotchkiss, Aluminum Co. of America; R. B. Jones, Trailmobile Co.; A. B. Wilber, Aluminum Co. of America; P. S. Shield, Davis Welding & Mfg. Co.; P. Walrath, Standard Oil Co. of New Jersey; A. Davis, Jr., Davis Welding & Mfg. Co.; A. B. Fey, Davis Welding & Mfg. Co.; E. M. Blott, Davis Welding & Mfg. Co.; E. P. Burton, Aluminum Co. of America; R. W. Knowles, the White Co. H. W. Kizer of the Texas Co. was present at the tests but does not appear in the picture*

conditions similar to those created in this test would not be encountered by a truck tank except in a garage fire.

The hydrostatic test was made with a heavy tank. The highest pressure obtained was 148 pounds per square inch at which point the pipe line failed. The pressure was so great that the tank took almost a spherical shape. A hydrostatic test to destruction may be made later.

Concerning the tests, Mr. Davis said:

"These particular tests may have a far reaching influence on the transportation end of the oil industry. I am sure the approximately 25 witnesses of the tests, including Aluminum Co., officials and representatives of the Standard Oil Co. of New Jersey, Cities Service Oil Co., National Refining Co., The Texas Co., White Co., Fruehauf Trailer Co., and Trailmobile Co., as well as our company, were almost shocked at the severe punishment which these aluminum compartments sustained without rupture.

"In fact, the interest was so great that, after the 25-foot drop of one of the aluminum compartments, filled with water, a number of the witnesses cheered like baseball fans, which made it very evident that the almost 100 per cent success of the tests was almost unexpected.

"The real significance of these tests, of course, was the demonstration that aluminum sheet made into truck tank compartments, where the proper tank construction is employed, although approximately half the weight of steel, compares very favorably in service and wreck resisting qualities with the blue annealed sheet steel used in tank construction. The tests seem to have demonstrated the practicability for the safe use of aluminum in truck tanks in fires.

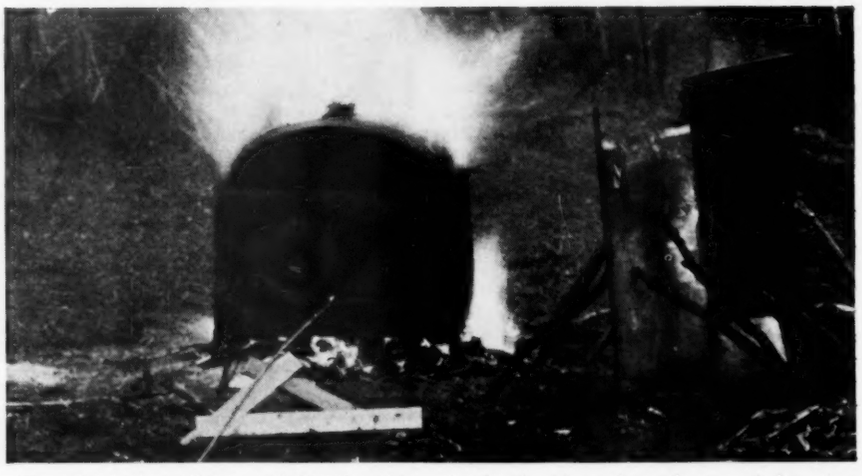
"This, of course, means the possibility that aluminum tanks, if properly designed and constructed, may be safely used on trucks with a saving in weight and such a consequent lowering of transportation costs that the employment of aluminum in the very near future for this purpose cannot be discounted.

"It is also claimed that the evaporation of gasoline is materially lower when carried in aluminum containers, especially when exposed to sunlight.

"These compartments were tested under conditions far more severe, of course, than they would receive normally. However, drop tests run a close parallel to conditions developed in severe wrecks and the fire test seemed to prove that the aluminum tank will behave satisfactorily in a severe truck tank fire; that is, until all the gasoline has disappeared the tank will not collapse."

The lighter compartments built of aluminum weighed 73 pounds each, as compared with 182 pounds for compartments built of 12 gauge steel. The heavier aluminum compartments weigh 105 pounds, as compared with 208 pounds for a 150-gallon compartment of 10 gauge steel.

The Davis company had accepted two orders for aluminum truck tanks subject to the outcome of the tests. An order for a third tank was placed at the conclusion of the tests by the representative of an oil company who was present at the tests.



*Fire test of a light weight aluminum tank showing the column of burning gasoline vapors blowing from the vent. The small pipe leading into the pyre conveyed a supply of kerosene to keep the fire burning briskly*

# Santa Fe Wells Now Nearing Sand Will Test Proration's Strength

By Jack N. Westsmith
N. P. N. STAFF WRITER

LOS ANGELES, Dec. 28

WITH approximately 75 wells to be completed at Santa Fe Springs prior to Jan. 15, executives in California's oil industry are girding their loins for another battle with old man "overproduction."

Based upon an average of 3600 barrels per well for new wells brought in during the proration period from Dec. 1 to 15, completions in the latter half of December and the first half of January may add as much as 200,000 barrels of flush oil to the daily output at Santa Fe Springs. Natural decline will account for a large part of this by allowing operators to bean their wells in without hazard to the wells themselves.

Completion of seven Santa Fe Springs wells during the week ended Dec. 28 added approximately 20,000 barrels of flush oil, although the field's total output increased only 7250 barrels.

Under a plan of operation to become effective Jan. 1, operators at Santa Fe Springs, aided by Umpire Grimm, will make every effort to keep production down to the desired figure of 150,000 barrels.

Because it is realized that small operators with only one or two producing wells and no drilling wells would ultimately be shut down entirely under present conditions, the umpire has had the following suggestion, which has been accepted by a majority of Santa Fe Springs operators.

### Protect Small Operators

The new plan is reminiscent of the former attempt at proration, under Umpire F. C. van Deinse, during the summer months of 1929. Umpire Grimm realized, as did Mr. van Deinse, that the smaller operators with production in the neighborhood of 100 to 200 barrels could not meet expenses if they were forced to meet the same percentage curtailment as made by large producers and mechanical difficulties also prevented such curtailment.

For this reason it has been agreed that small pumpers and flowing wells will be allowed to produce enough oil to more than meet current expenses. That is, if a well has a potential of about 150 barrels and would be cut normally to about 60 barrels daily, under the proposed plan an arbitrary figure of say 90 barrels would be set.

It is estimated that the total aggregate production of these small producers will be not much in excess of 35,000 barrels. The larger producers will therefore, have their output curtailed so as not to produce much in excess of, 150,000 barrels less 35,000 barrels, or 115,000 barrels per day.

As new wells are completed under this new program it will mean that the larger producers will suffer a cut of perhaps 60 per cent of their potential daily yield and will have to suffer the greater part of the curtailment burden.

Operators in the Elwood field reduced its daily output to 23,220 barrels Dec. 26, or 7000 barrels under the desired figure. An excessive cut was made to wipe out excess production shown for the field on the umpire's report of Dec. 15.

Maricopa Flats operators are reported to be contemplating curtailment of production. The output now is about 15,000 barrels daily of 20 to 28 gravity oil and the possibility exists that, without curtailment, the yield will exceed twice this amount within a few months.

Oscar Howard, an independent operator is preparing to set 4¾-inch casing at 8700 feet in his Hathaway 7 at Santa Fe Springs and it is expected that a production test will be made during the coming week. According to field reports the core barrel shows sands containing a good cut of oil between the point where the casing is to be set and the bottom of the hole at 9350 feet.

Other flush fields in California with the possible exception of Kettleman Hills are showing little to alarm operators, who are trying to keep production under the prescribed figures.

Ohio Oil Co.'s new well in the Playa Del Rey district, east of Venice, was making 2000 barrels of 22.8 gravity oil Dec. 26. Although "lease hounds" are very busy, oil companies with holdings in this area do not seem very anxious to drill in.

A part of the supposed structure thought to lie under the townlot area is within the city of Los Angeles, where drilling is prohibited. It is considered likely that the area will be rezoned if a sufficient number of the residents become interested, which of course they are not now, Not Much.

### Interest Revived in Seacliff

Shell Oil Co. revived interest in the Seacliff oil field, on the coast north of Ventura, by releasing 80 acres in that area from the Rincon Investment Co. Operators have firmly believed that oil existed at Seacliff in larger quantities than has been found up to date, but all efforts to find deeper and richer sands so far have been unsuccessful.

A. T. Jergins Trust, an independent company in the Signal Hill field, will make a test of its Municipal 9 the coming week. Nine and five-eights casing was set at 7155 feet, with bottom of the hole at 8324 feet. This well is the second deep test to be made of the Signal Hill field as Shell Oil Co. drilled its Nesa 11 to 9350 feet before suspending operations. More than 900 feet of oil sand are reported to have been cored in the Municipal well and it is thought to have an excellent chance for successful completion.

Continental Oil Co. is drilling below 5750 feet in its Bryant 1, a wildcat project that is to test out the possibilities of the area between Seal Beach and Signal Hill and to the east. Showings have not been favorable for obtaining a commercial producer in this well, but it is expected that drilling will not be stopped above the 6500 or even 7000-foot level.

Archer Oil Co.'s Watson 1, a wildcat near Wilmington, Calif., is drilling at 5165 feet in sand that causes some geologist to predict that this well will penetrate the same sand found by Ohio Oil Co. at Venice in its Recreation Gun Club 1. The Watson is approximately 12 miles southeast of Ohio's new gusher.

Leaders in the California industry are attempting to gain a sanction of the state officials to a plan whereby the state requirements for validation of tideland permits will be modified so that immediate drilling will not be necessary. Permits must now be drilled 1000 feet within one year after the permit is granted. Several companies are rushing their work to comply with the ruling. State executives are reported to be anxious to postpone the drilling of tideland wells until overproduction is out of the picture.

# Oklahoma Proration Order Issued

TULSA, Dec. 28.—The Oklahoma Corporation Commission Dec. 23 issued an order continuing proration in Oklahoma for the first three months of 1930, in accordance with a petition filed by Wirt Franklin, Independent producer of Ardmore, Okla. No objection was made to the issuance of the order.

Proration in the flush pool will continue on a basis of production of 50 to 80 per cent of the potential daily average in order to balance supply and demand. Oklahoma City pool will continue the time plan, that of alternately closing and opening wells, to meet production of 60 per cent in January and February and 50 per cent in March.

The commission again forbade purchasers and carriers of oil to buy and transport oil from the pools mentioned in quantity which would constitute violation of the order.

In the East Little River, Sasakwa and the Wilcox sand wells in the Allen pool, potential production gauges will be taken twice each month, continuing for two days and the average of the two days taken as the potential for that period.

In the Asher, Seminole City, East Seminole, Searight, Earlsboro, Maud, Mission, Bowlegs, Carr City, Little River, St. Louis-Pearson and Allen (other than Wilcox sand) pools, potentials will be taken according to decline curves.

For January, the potentials will be taken as 97 per cent of the December potentials except in the case of leases showing a decline sharper than three per cent an open flow test of five days will be taken and the average used as the potential. Similarly, leases showing an increase due to change in method of producing, such as cleaning out or shooting, may also have a five-day gauge and the average used as the potential.

In Logan county the practice is continued of using the family curve made up by production engineers some time ago, establishing the potential on its basis.

In East Earlsboro the potential production will be determined twice a month with the field divided into "A" and "B" wells, each group being opened for two days and the average used as the potential.

The Oklahoma City pool will continue its time method of proration. The order provides, however, that if the operators decide to use a percentage plan, the umpire shall determine the method of taking potentials.

**Gas Showing in Woodward County**

(By Telegraph)

TULSA, Dec. 30.—An important showing of gas has been encountered in a wildcat being drilled in Woodward county, Okla., by the Prairie Oil & Gas Co., and the Transcontinental Oil Co. The gas, estimated at about 4,000,000 cubic feet per day, was reached at 5931 feet. The well is in the NE of 23-23N-17W, about four miles east of the town of Quinlan.

# Gray County Proration Plan Agreed On

AMARILLO, Tex., Dec. 28.—For the first time in its productive history the Texas Panhandle is to have a real proration program. Beginning with Jan. 1 the big production of the larger pools in Gray county, will be cut 20 per cent for a period of 30 days. This decision came out of a meeting of company representatives held in Pampa Dec. 27 for the discussion of the pipeline and storage situation in the Panhandle. The meeting was presided over by H. M. Stalcup, of the Skelly Oil Co., who is chairman of the proration committee.

The plan was rejected by only one of the twelve companies voting. F. J. Adams, of the Gulf Production Co., strenuously objected to the proration of pumping wells. The Sunray Oil Co., could not subscribe to the plan because of a conflicting contract for production with the Operators Oil Co., from which they recently purchased its Panhandle holdings.

An administration committee, consisting of W. E. Hubbard of the Humble; F. P. Graham of the Skelly; D. J. Gibbon of the Texas Pipe Line Co.; Clyde Shields of the Prairie; and D. E. Williams of the Danciger Oil & Refining Co., was appointed. E. G. Daly, of Pampa, was made umpire.

Though the period of proration is but for 30 days, there is reason to believe that it will be continued beyond that time. Its prime object is to cut Gray county's present daily average of something in excess of 65,000 barrels to less than 40,000 barrels.

One of the best moves made by any company in the area to bring about this result was the recent complete shutting in by the Wilcox Oil & Gas Co., of its big producer in Sec. 35, Blk. 3, I&GN Survey. By so doing it prevented the drilling of not less than five wells. This is the ideal method of keeping production down. However, the new proration plan is a move in the right direction and even a limited time for it to be in force will bring good results.

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**Judge R. E. Brooks Dies**

HOUSTON, Dec. 29.—Funeral services were held Dec. 29 for Judge Richard Edward Brooks, 65-year-old Houston capitalist and one of the founders of The Texas Co. He died at his Houston home Dec. 28, after an illness of two years. Judge Brooks was identified with real estate, and was interested with his son R. E. Brooks Jr. in the Southern Exploration Co., at the time of his death. He resigned from The Texas Co. in 1920.

# Search for Future Reserves Goes on in California

LOS ANGELES, Dec. 24.—R. A. Broomfield, president of the California Oil and Gas Association, in a recent summary of contemplated action in California's oil industry during 1930 pointed out that, while there is a general slowing-down of drilling in the proven oil fields, due to overproduction, at the same time there are more than 100 exploratory wells being drilled in California.

It is expected that a great deal more exploratory work will be undertaken during the early part of the new year but, because of the scarcity of future townlot drilling, the first half of 1930 is not expected to show as many new wells started as during a similar period in 1929 or 1928.

Mr. Broomfield states that, although drilling activities may be curtailed during 1930, the oil companies will round out other departments in their organizations. He adds that one company is negotiating to buy a fleet of oil-tankers, another is making preparations to build a pipe line to connect two or three fields, another is cleaning out and rehabilitating 100 old wells, several others are installing new refinery equipment and some are preparing to construct compressor plants to be used in pumping excess gas back into depleted oil sands.

Conservation measures being adopted by the oil companies, says Mr. Broomfield, will be of value to themselves as well as to the public, as the gas which is being put back into the ground will assist in bringing more oil to the surface when it may be greatly needed.

All of this work calls for a wide range of activity, and it is hoped that oil field workers who might suffer as a result of curtailment of drilling in known fields will have an opportunity to keep actively engaged.

The oil companies in general are planning their work for the coming year with a view to conserving as much oil and gas as possible, keeping their working forces quite generally occupied, and, if possible, finding new sources of supply from which to draw upon in future years.

# The Editors' Viewpoint

National Petroleum News

## Lessons From 1929 Can Bring Prosperous 1930

GREETINGS! We wish you all a prosperous 1930! And a prosperous year is possible if every member of our industry applies good common sense in his business activities. That means prorating of flush pool crude production to consumption demand, holding refinery output to market demand, and adherence to the code of marketing practices in spirit as well as in letter.

Two items of progress marked 1929 as probably the most important year in the history of our industry since the bringing in of the Drake well. These items were the code and the conservation movement—the California gas law and the voluntary arrangements in Oklahoma and Texas.

For the refining division the year provided the American Petroleum Institute weekly statistics on refinery runs by districts and on the size of gasoline and fuel oil stocks held by refiners.

These refinery statistics also are helpful to the producing division because when considered with the institute's weekly production statistics, they are an index as to whether crude oil production is above or below current market needs.

The producing division should continue the voluntary arrangements for crude conservation, in view of the large supply of crude already in aboveground storage. Whether prosperity will bless the production division is entirely a problem within the control of the division.

With the present flexibility of refining processes, building of excessive stocks of refined products should be zealously avoided. Optimism may run away with some operators, but they should analyze their prospective markets and estimate as near as is humanly possible the volume of goods they may put out without breaking the market structure and their own possibilities of profits which rightly should accrue to their capital investments.

If too large a volume of major products is manufactured, prices are bound to fall. Nothing can hold them up. But if output of refineries is gauged with market demand, the refining companies will earn a profit and the public will buy goods at fair and reasonable prices.

There has been a tendency in some parts of the country to adhere to the code of ethics in letter but to violate its spirit. The station lease and authorized agents' agreement have been made means of stabilizing the market by giving the sounder business practitioners control over the outlets leased. But inducements offered orally in efforts to get the leases have surely violated the spirit of the code and will surely be the means of eventually wrecking the code structure.

The large companies have been the chief offenders in this aspect of the code and it now looks as if it is up to the large companies to make 1930 a profitable year in distribution. The code must be followed in spirit.

The men to whom the industry looks for leadership undoubtedly recognize the dangers of crude and refined oil overproduction and prodigality in marketing. We believe that, in large measure, they can steer the industry in all its divisions clear of those dangers and make 1930 truly prosperous.—R. B. S.

## Leadership Lies Within the Industry

SOME discussion in the newspapers, following the meeting of the American Petroleum Institute in Chicago in December, has brought to public attention again the question of an outsider for head of the institute, and, through that position, for a leader and spokesman for the oil industry generally. This time it was the name of Mr. Coolidge which was linked up with that position.

Lest the wrong impression be given as to the seriousness with which this suggestion is being received by the industry itself, it should be pointed out that there was probably less discussion given this matter at this last institute meeting than at some previous ones. As far as is known, the head of one major company brought the idea of the oil industry picking Mr. Coolidge for this job to Chicago, but not many with whom he talked seemed to warm up to the proposal.

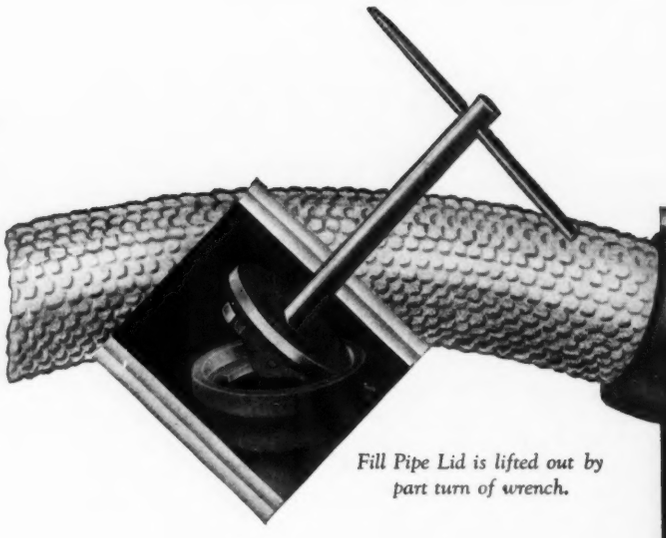
When you get down to the abstract idea of an outside leader, sometimes called a "dictator," for the oil industry, what would we gain through the creation of such a position, granting that the best man for the job in the country would accept it?

The problems of the industry now are pretty much internal ones, and they are also the same as many other industries are facing—over-production of supply through failure to study closely enough market needs and then adhere to them. If the oil industry needs an outside leader to bring it to the successful solution of this problem, then so do many other lines of business that could be mentioned.

The responsibility for the leadership in the oil industry, in the face of its present difficulties, lies wholly with the executives of the larger companies, a fact which they recognize and accept. They know they could not pass that responsibility over to some outsider—regardless of how capable that individual might be—even if they so desired, and still fulfill their obligation to the public and their stockholders.

The industry has made progress the past year or so in the kind of leadership it needs, even if the results are not as tangible as might be wished. That leadership involves only control by the major executives of their company operations in line with what the market will absorb, be it crude oil, gasoline or any other commodity.

The institute is more and more fulfilling its natural function in giving the industry at large the facts and figures upon which to make its operating decisions. It remains largely for the executives to make more practical use of these data in their individual company operations, to bring a degree of collective management to the industry that will pretty much solve its problems.—V. B. G.



*Fill Pipe Lid is lifted out by part turn of wrench.*

*Special Nozzle with lugged locking device —slips down into fill pipe cap.*

# CONNECTIONS are made so much QUICKER *with this Fill Pipe Coupling*

*Part turn of wings on lugged locking device makes the connection TIGHT*

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# Wheaton

FAUCETS · VALVES · JOINTS · COUPLINGS · FILLERS · NOZZLES · FITTINGS

**IT IS customary to print something** about now calling attention to the deep significance of the New Year. We have sat here staring at our typewriter for a quarter hour, which is as much thought as we ever give to any subject, and have decided that we have no sermon to preach. Maybe there is a spiritual meaning to the starting off of another year—there should be food for thought in the fact that we have ahead of us another opportunity to turn over a new page and begin again. All we can think of at the moment are the distressing facts that taxes become delinquent at the end of January; that new auto license tags will have to be purchased very soon; that the merchants will start their nasty reminders of what happened during the merry holiday season and that oil news gets scarcer in direct ratio to the growth of the conservation movement.

Welcome, 1930!

* * *

**John E. Van Dall, district geologist** at Oklahoma City for the Sinclair Oil & Gas Co., has begun the manufacture of the small machine he invented for washing formation cuttings. Rock samples are placed in screen cases and whirled through running water by an electric motor. It is pronounced a considerable time saver over the hand method customarily employed. Several of the companies have bought one or more of the machines.

* * *

**One of the good jokes we recently** heard was related by Dr. Gustav Egloff, of the Universal Oil Products Co. As we prepared to alight from a train we were struck by the number of golf clubs the doctor was carrying with him. There seemed to be about 20 of them. We inquired whether he really used all of them.

"Oh, yes," he said, "there is a club for every stroke. It is like the case of the man who was playing a round by himself. His wife appointed herself as critic of the performance. She found something wrong with practically everything he did. Finally, after the final putt at the eighteenth, he took a club from his bag and killed her. He went back to the clubhouse.

"'Where's your wife, John?' asked the pro.

"'Oh, I killed her with a club back there.'

"'Which club did you use?' inquired the pro eagerly.

"'Brassie.'

"'Just the club for that shot.'"

* * *

**Overheard in a lobby: "A friend of** mine bought a quart from that fellow a month ago and he has lived on milk toast ever since. The bootlegger said it was right off the boat. My friend said he believed it but he wasn't sure whether it was off the bottom or the sides."

* * *

**R. A. Liddle, Pure Oil Co. geologist,** recently addressed the Tulsa Geological Society on Venezuela. At the conclusion of his talk he said he was supposed to ask for discussion and that he was somewhat timid about it. On a similar occasion recently a family, consisting of man, wife and small daughter, occupied front row seats. After Mr. Liddle finished his remarks he asked whether anyone had a question. Whereat the small girl spoke up:

"Yes," she demanded, "when do we go home?"

*Max W. Ball, geologist and chairman of the board of the Milmac Oil Co., will spend considerable of his time in the near future in Fort Worth, where general offices of the company are being removed from Tulsa. Mr. Ball still calls Denver his home*

* * *

**Santa Claus, impersonated by the** federal court of appeals, brought to O. O. Owens, Tulsa oil man, a jail term. Mr. Owens about two years ago aired his opinions of the state supreme court in a newspaper advertisemnt and was chucked into the Oklahoma county jail for a year for contempt. He finally obtained his release on habeas corpus writ issued by a federal circuit judge, pending outcome of appeal. The original sentence has been affirmed and unless the supreme court of the United States interferes Mr. Owens will have to serve the unexpired portion of his term, about six months.

* * *

**Interest in corn shucking having** been revived by the recent contests in several states, L. E. Phillips, executive of the Phillips Petroleum Co., has hung up a prize of $1000 for the grand champion of 1930. The money has been put into the hands of the department of agriculture whose secretary, Arthur M. Hyde, is authority for the statement that Mr. Phillips tossed a mean peg himself when he was growing up on a farm in Iowa. His record was 110 bushels in eight hours.

* * *

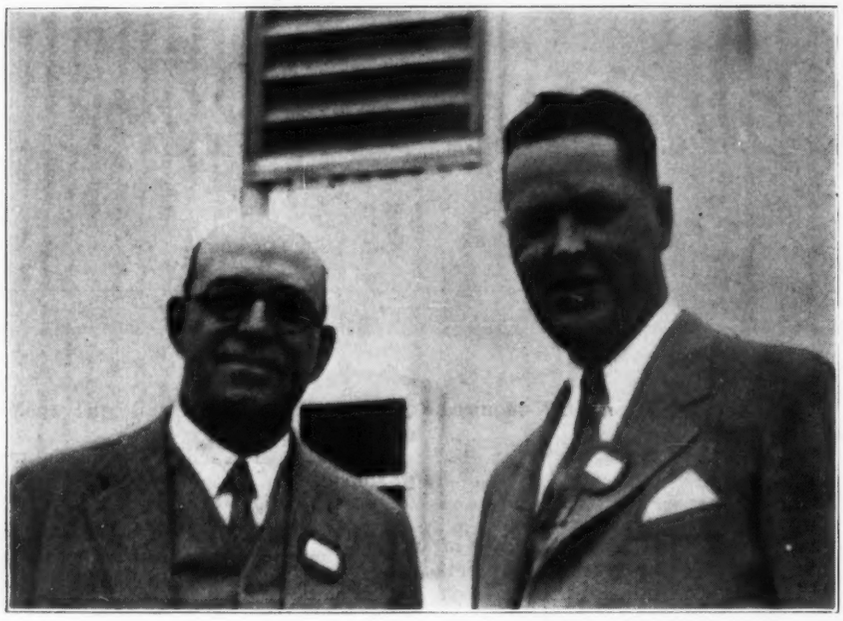
**Perry, Okla., is starting a movement** to get a new hotel. Such a development will be greatly appreciated by all storm-bound oil men who have to tie up there overnight.

* * *

**Died: In Dallas, R. H. Shattuck,** oil producer, formerly a resident of Tulsa and one time superintendent for the Atlantic Oil Producing Co. He leaves a wife and an adopted daughter.

* * *

**Governor Reed, of Kansas, con**tinues to try to mystify the public on the tax question so that it will keep asking, "Did he push, or was he shoved?" He turned the whole matter of finding some new ways of getting money to a commission. That body reported and it is now up to the legislature to say whether taxes are to be increased. Now the governor



*Wherever there is the hint of a little drilling excitement in the Mid-Continent there you will see, together or separately, these two gentlemen. On the left is A. M. Bowman, and on the right is S. P. Wallace, both of the Parkersburg Rig & Reel Co.*

appears to be trying to get the legislature to decide whether it shall meet in special session. The Wichita Eagle comments:

"Generally, over the state there seems to be no doubt in the minds of the taxpayers as to the general casualty coming to them. They expect new taxes to be added with the assurance that they are substitutes for old taxes and then discover that mysteriously the old taxes are still with them. Long familiarity with tax reform deprives them of the pleasures of self-deception on that point."

This point has been repeatedly made in these columns with reference to the gross production tax recommended for the state, which would not be in lieu of all ad valorem taxes now paid. There has been much backing and filling by the governor and the legislature and it is refreshing to note that the press, or a part of it, is seeing entirely through the whole matter.

* * *

**One Harry M. Loss, of Wichita, is** hereby awarded the gold-headed walking stick given each year by this department for noteworthy common sense. It seems that Mr. Loss has some 20,000 acres of land in Texas and he has been besieged with offers to lease it for oil purposes. The bonuses that have been promised by companies that are bidding are quite large. He will accept one of them soon. Yet he hasn't bought a thing with the money he is certain to get except a new car which he will accept delivery on when he finally closes his deal.

**One of the most welcome pieces of** highway construction is that in Texas from the Red River north of Wichita Falls to Del Rio, on the Mexican border. With the voting of bonds by Haskell county, this entire stretch is either paved, under construction or financed.

* * *

**Guy H. Woodward has resigned as** secretary and counsel of the Mid-Continent Royalty Owners Association to become counsel for the Homestake Oil & Gas Co. and the Homestake Royalty Co.

* * *

**W. E. Blenkiron, electrical engineer,** has been transferred from Borger, Tex., to Midwest, Wyo., by the Midwest Refining Co.

* * *

**J. B. Charles, petroleum engineer,** Tidal Oil Co., has resigned to enter sales engineering work with the Ingersoll-Rand Co. He is the second Tidal man to take up this line of work, George B. Small, of the Tidal's engineering department and inventor of the Smallamatic, the automatic flowing device for little wells, having joined Ingersoll-Rand a month ago.

* * *

**C. A. Willis, sales manager of the** Cities Service Oil Co., Tulsa, is recovering in a Tulsa hospital from a somewhat serious illness.

* * *

**W. J. Dykeman, Jr., who has for the** past two years been chief accountant for the Lago Petroleum Corp. at Maracaibo, Venezuela, returned recently to become first assistant to F. J. Keleher, general auditor of the Dixie Oil Co., in Tulsa. This connection of two accounting experts is but a continuation of a similar relationship which existed before Mr. Dykeman left for South America. At that time Mr. Keleher was treasurer of the Midwest Exploration Co., at Amarillo.

* * *

**Born: To Mr. and Mrs. W. K. Warren,** of Tulsa, a girl. Mr. Warren is president of the Warren Petroleum Co.

## Arrange Final Details Of Safety Contest

TULSA, Dec. 30.—Final details for the second petroleum safety contest in Oklahoma have been completed and the rules sent to the companies who have entered the contest. This one will be in the Ponca City-Burbank district. The first contest was in the greater Seminole district last summer.

The contest is sponsored by the Petroleum Safety Council and the safety section of the Mid-Continent Oil & Gas Association of Tulsa, and the Petroleum section, National Safety Council, Chicago. The Ponca City-Burbank district contest will run from midnight, Dec. 31, to midnight March 31.

The award in the various classes will be made on the frequency rate which shall be the number of lost time injuries occurring per million hours worked.

A lost time injury has been defined by the rules committee as an injury causing loss of time beyond the day, shift, or tour in which the accident occurred. If the injured does not return to his regular occupation within this time it will be considered a lost time injury.

The committee has divided the companies into production, refining, gasoline, pipe line and transportation classes, with two subdivisions under each with the exception of the transportation class. Final entry date has been set at Jan. 15.

Units operating in Osage or Kay counties, or in the vicinity of Ponca City, Garber or Covington, and refining units at Enid or Blackwell, Okla., and Arkansas City, Kan. may enter the contest.

The following companies have entered the contest:

Sinclair Oil & Gas Co., Carter Oil Co., Gypsy Oil Co., Comar Oil Co., Shell Petroleum Corp., Phillips Petroleum Co., Mid-Kansas Oil & Gas Co., Romarti, Empire Oil & Gas Co., Continental Oil Co., Oklahoma Natural Gas Corp., Prairie Oil & Gas Co., Mid-Continent Petroleum Corp., Indian Territory Illuminating Oil Co., Atlantic Oil Producing Co., Shell Pipe Line Co., and Tidal Oil Co.

SAFETY B SAFETY D SERVICE

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Davis Gas Mask—Type M-O—with Canister of 2000 cc. capacity, worn on back. Offering high protection against Organic Vapors, and especially high protection against $H_2S$ in "sour" crude oils.

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—Type M-O—equipped with the OC-4 Canister, is recommended for use by Gaugers, being especially adapted for protection against Hydrogen Sulphide.

The Canister on the back, can be carried for hours with perfect comfort.

The Exhalation Valve does not interfere with the head motion in any direction.

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## Years Ahead In Design

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This puts Davis Masks in a class by themselves.

Red-D Rubber has a marked increased tendency to hold its shape and offers longer life.

Davis Gas Masks of "long life" Red-D Rubber + "long life" 2000 cc. Canisters = **Protection**

Davis Canisters are available to protect against almost any known gas or combination of gases. You will be delighted with the high absorbing efficiency of Davis Canisters.

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Name .....

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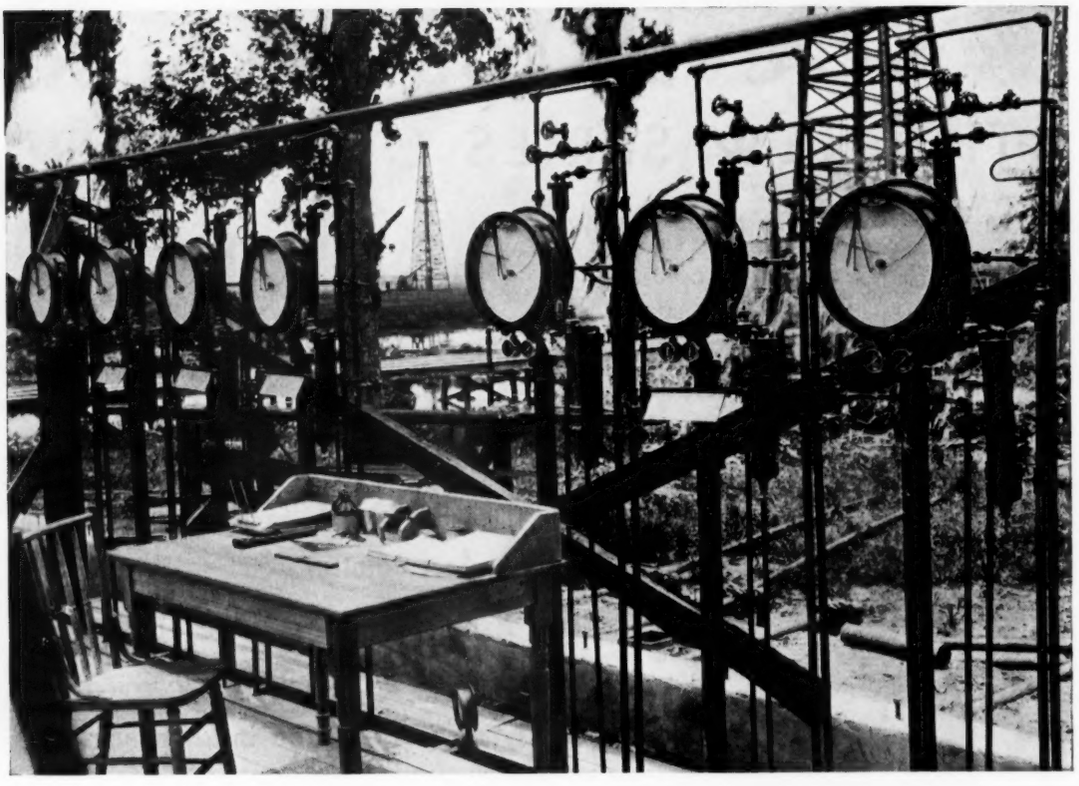
# Prevent By-passing and Jamming
## *of your* repressured Oil Sands



DON'T lose oil or time by permitting your wells to by-pass or become plugged. Install Foxboro Volume Controllers on the gas lines to key wells of your repressured properties. These instruments by their proper reactions to conditions maintain uniform distribution of gas values through the oil sand. They prevent the tendency to by-pass. They help you to speed up the repressuring of oil sands with perfect safety and give invaluable records for analyzing the sand reactions.

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*Above: Foxboro Volume Controllers in operation on the repressuring of the Vacuum Oil Company's wells, Westlake, La.*

**INSTRUMENTS *for* CONTROLLING, RECORDING *and* INDICATING TEMPERATURE, FLOW, HUMIDITY *and* PRESSURE**

# Drilling Campaign Begins in New Pool Opened in Seminole County

By John Power
N. P. N. STAFF WRITER

TULSA, Dec. 28

THE southeastern part of Seminole county claimed most of what attention was paid to new development in Oklahoma during Christmas week. A 100-barrel-an-hour-initial Cromwell sand producer in the NE SE SE of 8-6-6, near Konawa, was the center of attraction.

The rest of the state kept fairly busy for holiday times, the Oklahoma City pool spending most of the week taking gages on some of the huge wells which have been recently completed; the northern part, up around Perry getting its excitement from a partially completed Layton sand well which is swabbing about 27 barrels hourly; and the East Earlsboro pool turning in a well remarkable chiefly for its size of some 5000 barrels, considerably better than any of the more recent completions in the pool.

The Harris et al No. 2 Harjoche, the new well near Konawa is offset on the north by a Wilcox sand failure which was plugged back to the Cromwell, where it has been averaging some 260 barrels daily. This well did not have as good a sand body as the more recently completed producer, the pay being broken and irregular. Nor has production on the No. 2 well held up any too strongly, the gages having declined in a few days from around 2500 barrels to 1935 barrels Dec. 25, and to 1530 barrels Dec. 26. The sand was topped at 2850 feet in the No. 2 well, and was drilled to 2862.

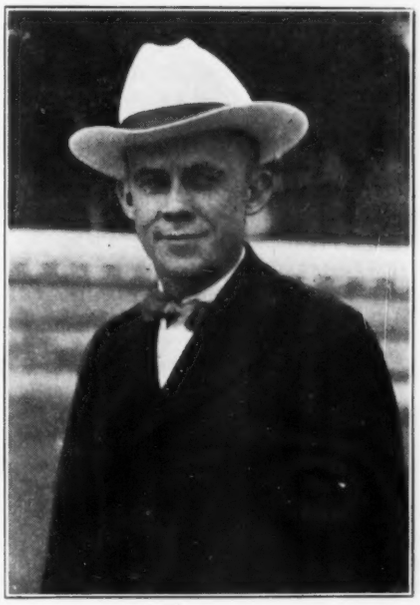
One of the chief points which adds to the importance of the well, coupled with the Cromwell sand strikes reported recently in the East Little River area, is the force it adds to the idea that this part of the general Seminole area may be well worth reworking for the shallower production which was passed up during the development of the Simpson and Wilcox sands. In addition to E. L. Harris, the Wilcox Oil & Gas Co., and the Mid-Continent Petroleum Corp. and others are interested in the well.

The other wildcat strike for Oklahoma during the week was in the northern part, near Perry, where the Peerless Oil & Gas Co., Prairie Oil & Gas Co. et al have a likely looking well in their No. 1 Wentz, in the NW NW SW of 22-22-1E. The test was showing for a well last week, but the intrusion of water from up the hole made it necessary to delay completing until 6-inch pipe had been run. The shut-off was satisfactory, and further drilling from the top of the sand at 3282 to 3300 brought production of oil and gas at the rate of 27 barrels hourly and of gas at one million cubic feet per day. The principal part of the production is coming from the last 18 inches of pay drilled.

No pipe line connections are as yet available, and the 500 barrels of tankage on the lease is full, so the exact capacity of the well still is undetermined. The swabbing to which the well was subjected did not lower the fluid level below the 2500 foot mark from bottom.

The nearest production of consequence is the Watchorn pool ten miles to the northeast, which, although not extensive, has contained some long lived wells.

For Oklahoma City the holiday period was devoted principally to the taking of gages, either partial, or for 24 hours, of some of the big wells which had been previously completed. The state's biggest well, the I.T.I.O. et al No. 1 Thomas Fuzzell in 13-11-3W was opened for 18 hours and made 27,390 barrels. This will be remembered as the record breaking well which fell just short of making 43,000 barrels the first 24 hours.



*Wherever there is oil production in his territory or discussion of how to get it there will be found E. G. Allen, central division general superintendent of Shell Petroleum Corp. He makes headquarters at Dallas*

Perhaps more important than the amount of oil the well made when reopened was the fact that it also made 7 per cent water and emulsion. The intrusion of water into the big lime wells continues to increase, along with the speculation as to when, and how seriously, this condition will affect the sand wells on the flanks of the lime production.

Another well to show water for the first time was the T. B. Slick No. 2 Glidden, which made 1475 barrels in 24 hours, with 2 per cent water.

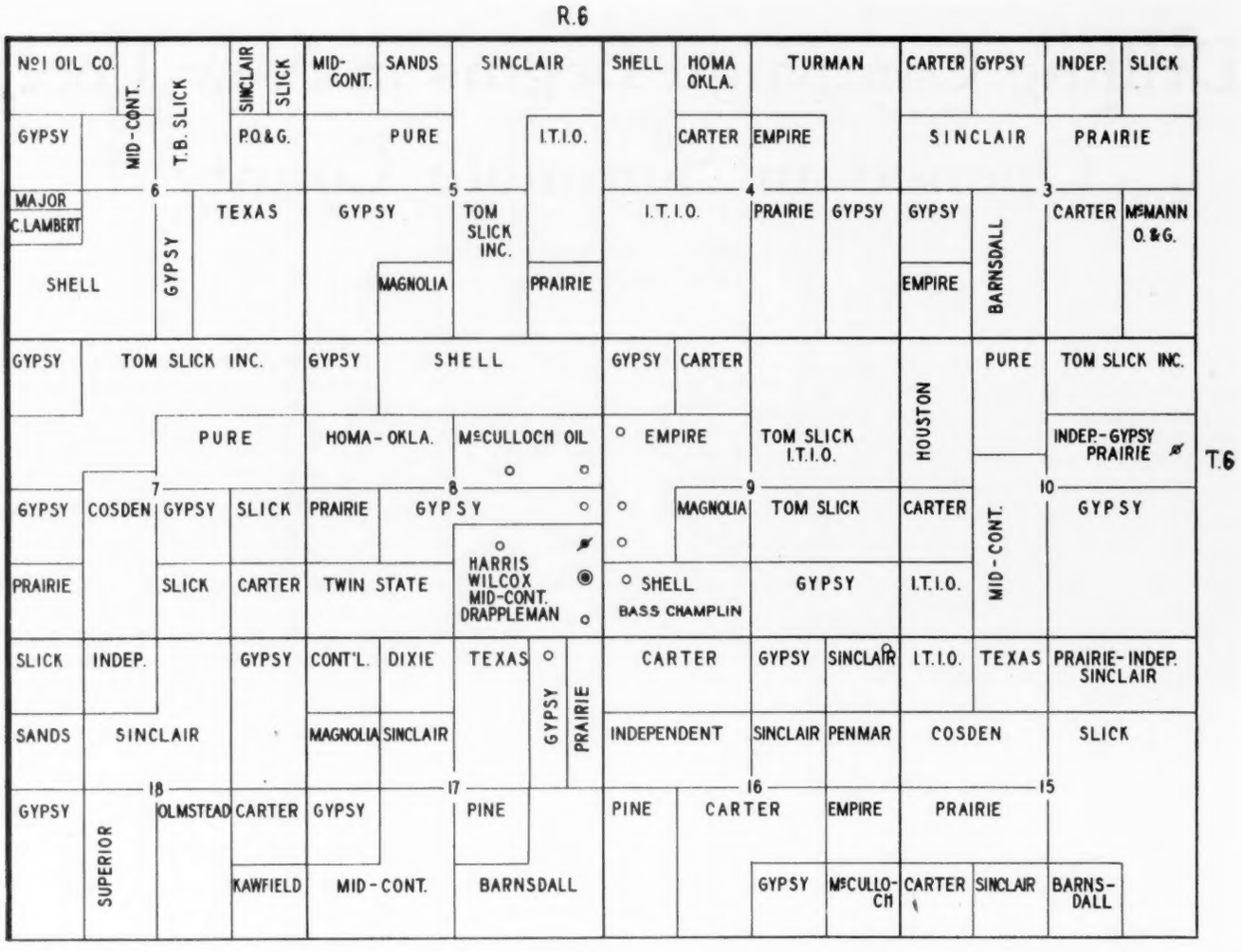
The Skelly Oil Co. Hoopes well was opened for five hours and 45 minutes, and did its stuff to the tune of 9253 barrels of oil in that time. On some of the previous gages great trouble had been caused by the sand coming along with the oil cutting the connections. It was reported that less sand was brought to the surface during this gage than with those previously taken. This is the largest of the sand wells completed in the field to date, and extends production a location on the southeast edge of the pool.

Among those listed as big wells once, but victims of the increasing water was the Sinclair's No. 1 Stamper, which has declined in oil production 380 barrels per day, on air. The water production from the well is holding up in fine style, however, the gage on it being some 4000 barrels per day.

The field as a whole made 97,093 barrels from 22 wells on Dec. 24. There were 37 completed producers shut in for proration at the time.

By far the best well completed recently in the East Earlsboro pool was the Shell Petroleum Corp. No. 3 Hopper, which made 5390 barrels initial from the Wilcox topped at 4200. The well, which is on the east side of the pool, is in the NE SE NE of 19-9-6.

More typical of the wells brought




*The area around the new Cromwell strike in Seminole county is being rapidly staked for new locations. It is expected that the area will be brought under the general proration control affecting other new pools*

in lately in the pool is the Carter Oil Co.'s No. 1 Chowning, in the SW NW SW of 19-9-6, seven-eighths of a mile west and a location south of the Shell's producer. The former made 155 barrels on air in four hours from the Wilcox topped at 4142-54 feet.

* * *

**Notes on the Week**

The west Allen area, where production is obtained sporadically from the Wilcox, added another producer during the week in the Sinclair Oil & Gas Co. No. 5 Jefferson. The top of the second Wilcox was at 4208. Drilled to 4227, the well made 800 barrels in 18 hours. It is in the NW NE SE of 23-5-7.

* * *

The Chandler area, Lincoln county, added another small well, typical of many that have been completed in the pool. The new one is the Magnolia Petroleum Co. No. 1 Waggoner, NE NW NE of 17-14-4. It made 231 barrels in 24 hours.

## Empire Considers Line To Oklahoma City

TULSA, Dec. 28.—An 8-inch pipe line outlet for the Oklahoma City pool is under consideration by the Empire Oil & Refining Co. The line, which would be about 90 miles long, would connect with the Empire's line running from the Healdton field to Gainesville, Texas.

The Empire owns and operates a refinery at Gainesville of about 5000 barrels capacity. It is equipped with both skimming and cracking units. The plant is supplied with crude from the Healdton field, which is now making but 22,000 barrels daily as a whole.

Of this amount the Empire can get connections for but 2500 barrels daily, so that the additional crude for the refinery has to be made up from other sources. The present plant through-put is about 3600 barrels daily.

Construction of a line from the Oklahoma City pool would solve the Empire's problem for this plant, it feels. Nothing definite has been done with regard to the construction of the line, but the Empire is said to be considering the project seriously.

## Wilbarger County Output To Be Prorated

HOUSTON, Dec. 27.—Prorating of crude oil runs from properties with which they are connected in the Wilbarger County division of the greater Wichita Falls district is announced for Jan. 1 by two pipeline companies.

The Humble Pipeline Co. will cut its runs 50 per cent to approximately 5000 barrels daily. The Sinclair Crude Oil Purchasing Co. will reduce runs 35 per cent to approximately 6000 barrels daily.

No announcements have been made as yet regarding policies of The Texas Pipeline Co., and the Waggoner Refining Co., which also have systems serving the territory. Wilbarger production has recently averaged approximately 32,000 barrels daily, so that announced prorating of runs will bring down the crude shipments to 24,000 barrels daily or less.

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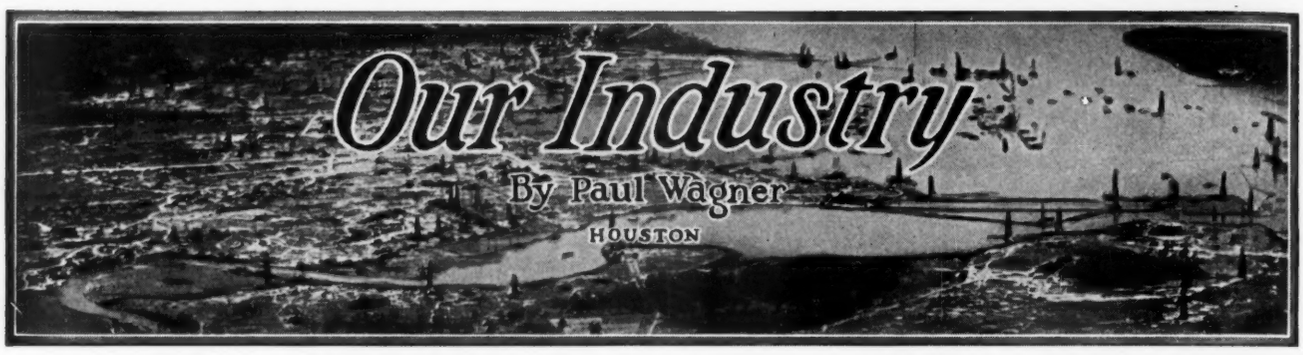
# GREENSPON'S

## PIPE FOR ALL PURPOSES




A COPY of the eighteenth annual report, part two, of the United States Geological Survey, containing Dr. Robert T. Hill's monumental treatise on the Edwards Plateau and the Rio Grande Plain, is available through the Houston office of *National Petroleum News* to some interested geologist who has "duplicates" of other publications to trade for it.

The volume is an extra copy, in the best of condition, of a rare report priced at $35 to $40 in southwestern book stores handling secondhand geological books. Because of its value and with the idea of rendering a service to some geologist who actually needs it the book is offered in exchange.

In addition to Dr. Hill's work on the geology of the territory covered in the report, a treatise of similar scope on the paleontology of the region is given in the book by T. Wayland Vaughan.

* * *

**West Texas operating headquarters** of the Vacuum Oil Co. are being moved from Midland to San Angelo, and Eastland offices for the Central Mineral Belt are being combined with the western base. R. H. Woods, in charge at Midland, takes his entire organization with him to San Angelo, from which base operations in the Permian salt basin of West Texas and southeastern New Mexico will continue to be carried on. Harry M. Sample, in charge of land offices at Eastland, will be transferred either to Houston or Tyler. J. B. D. Woodburn, formerly at Wichita Falls, will scout the general Ranger territory and the greater Wichita Falls district from new headquarters established at Breckenridge, Stephens county.

* * *

**J. H. (Harold) Vance, formerly** production superintendent of the Continental Oil Co., at Jal, New Mexico, is now general manager of the Balance Oil Co., which recently opened West Texas offices in the Petroleum building at Midland. The Tecon Oil Co., W. M. Eagan superintendent, also has opened Midland offices in the Petroleum building.

* * *

**A townsite near the new Ector** county oil field of West Texas is being developed by John T. Cross, who is also known as the "father of Wink," which he developed in the early days of Hendricks field operations in West Texas. Mr. Cross, who was formerly county judge at Odessa, calls the newest West Texas oil town by the name of Badger. The town is 17 miles west of Odessa on land owned by W. E. Connell, president of the First National Bank, Fort Worth, and Allen B. Connell of Odessa.

* * *

**Shipley Oil Co., operating in Ward** county, West Texas, and maintaining offices at Midland, elected the following directors at its annual meeting: John F. Shipley and Joe E. Shipley, Midland; John M. Shipley, Wichita Falls; S. F. Hayzlett, Graham, Mo.; L. C. Mingus, Nowata, Okla.

* * *

**Grady Kirby of the Gulf Production** Co.'s organization in southwest Texas makes his headquarters at San Antonio. He is a geologist by training, though his activities are largely concerned with land department work.

*Grady Kirby*

**Mr. Kirby is widely known and an active member of the American Association of Petroleum Geologists.**

* * *

**T. P. (Tommy) Williams, formerly** assistant to B. L. Ryan, superintendent of the Shell Petroleum Corp.'s land department at Dallas, has moved to San Angelo to operate independently in West Texas. He was succeeded by Howard B. Pyle in the Shell organization.

* * *

**Walter Alexander, formerly connected** with the Continental Oil Co.'s organization at Wichita Falls, is now identified with operations of Frank Cullum in similar territory.

* * *

**New members of the executive** committee of the National Oil Scouts Association of America include L. R. Caskey of the Republic Production Co., San Angelo, and W. C. Kleine of Corpus Christi. Mr. Caskey succeeded R. P. Robinson of the Skelly Oil Co., San Angelo, resigned. Mr. Kleine succeeded Starr Pope of Corpus Christi.

* * *

**Acquisition of new oil leases, oil** lands and oil properties by the Union Oil Co. of California hereafter will be handled by the geological department, according to a notice issued through Chester W. Brown, director of exploration and production. John S. Schalk has been placed in direct charge of oil lands and leasing under Desaix B. Myers, chief geologist, taking with him to his new activities D. C. Ingersoll, George H. McCarthy and Albert S. Sales.

The land department, in charge of John L. Church as manager, will continue to handle affairs pertaining to company-owned lands (except sales department properties) and all new lands and leases after their acquisition by the geological department. H. H. Hart, supervisor of franchises and rights-of-way, will report hereafter to William Groundwater, transportation manager, and Hubert C. Ferry has been transferred to the legal department.

* * *

**W. R. Finney, who now makes headquarters** in New York City with the Pan American Petroleum & Transport

Co., was formerly connected with the gasoline department of the Midwest Refining Co., subsidiary of the Standard Oil Co. of Indiana.

* * *

**Wayne F. Bowman of the consulting** geological firm of Bowman & Vetter, Second National Bank building, Houston, was attached to the geological staff of the Rio Bravo Oil Co., Southern Pacific subsidiary, before engaging in business for himself. He was joined in the present partnership by John M. Vetter, formerly head of the Rio Bravo's land department, about a year after he first left company work. At one time Mr. Bowman was connected with the

*W. F. Bowman*

Bureau of Economic Geology at Austin, which is the equivalent of a Texas state geological survey.

* * *

**Eph W. Sanders, rig builder, ac**companied by Enoch Sanders and Robert La Mar, oil well drillers, are now on their way to Central America for preliminary work on a tract of 500,000 acres leased from the Nicaraguan government by the California Mammoth Oil Co. Herman Layer, executive vice president of the California Mammoth, is authority for the statement that equipment sent on the Pacific Mail Steamship Guatemala for their use constitutes the largest individual consignment of its kind ever sent to a foreign country from Los Angeles harbor.

* * *

**A 50 per cent cash dividend,** amounting to $50 a share, has just been paid by the Luling Oil & Gas Co. to its stockholders, most of whom are residents of San Antonio. Properties of the company are almost exclusively located in the Salt Flat field, northeast of Luling, where developed leaseholds are owned jointly with Humble Oil & Refining Co., which operates them. T. Noah Smith is president of the Luling Oil & Gas Co.; W. J. Walthall is secretary; John L. Clem, treasurer; Ward Kelly and Worthy Gee, in addition to the aforementioned, are directors.

* * *

**Gail F. Moulton, formerly in charge** of the oil and gas division of the Illinois State Geological Survey, now heads a regional geological staff assembled in Mississippi by the Louisiana Gas & Fuel Co., Shreveport. He is assisted by Jackson S. Young, geological scout, also formerly of Urbana, Ill. Both Messrs. Moulton and Young make headquarters in the Miazza-Wood building at Meridan, Miss. Besides his service on the Illinois survey, Mr. Moulton's earlier activities included work on the United States Geological survey in the western part of the country, on the state geological survey of South Dakota, for the Shell Petroleum Corp., in Oklahoma, and for the Imperial Oil, Ltd., in Canada.

* * *

**Mrs. Charlie M. Matthews, chief** deputy sheriff of Ector county, West Texas, finds her law enforcement duties a nice job, she says. Mrs. Matthews, blue-eyed and brown-haired, spends most of her time at office work but frequently makes arrests when no other officers are available. She is a crack shot and carries a pistol in a holster attached to a belt around her waist.

* * *

**A. D. Sloan, vice president of the** Sinclair Gulf Pipeline Co., at Houston, is the operating manager of a system which serves to connect Coastal Texas properties of the Sinclair Oil & Gas Co. with the Houston ship channel plant of the Sinclair Refining Co. He has held his present position for years. Before joining the Sinclair organization and being subsequently transferred to Gulf Coastal Texas, Mr. Sloan spent many years in oil transportation service with the Prairie Pipeline Co., in the Mid-Continent.

## New Natural Gas Test Method Published

TULSA, Dec. 27.—Test procedure for the new type of gas density balance for determining the specific gravity of gases has been published by the Natural Gasoline Association of America, following its adoption by the Board of Directors. The procedure will be a tentative standard for a period of one year, beginning Jan. 1. Unless some change should be found necessary the method will become standard effective Jan. 1, 1931.

The test method was drafted by the gas testing committee of the association, after the new balance was given thorough tests in the field, and was demonstrated by S. F. Pickering, associate chemist of the U. S. Bureau of Standards, who designed the apparatus. Accompanying the test methods as published is a detailed description of the balance, together with description of auxiliary equipment. The balance was described in NATIONAL PETROLEUM NEWS, issue of Dec. 18, page 33.

The test procedure method and description of apparatus as published by the association carries the following foreword:

"The specific gravity of gases shall be determined by means of a gas balance constructed, as to principle, similar to the Edwards gravity balance described in Technologic Paper No. 89, United States Bureau of Standards. This principle embodies Boyle's law which prescribes that the density of a gas at constant temperature is proportional to its pressure; or restating this law as quoted in the technologic paper referred to, 'the densities of two gases at normal pressure are in inverse ratio to the pressures when of equal buoyant force.'"

Description of the auxiliary equipment and the complete outline of the test procedure can be secured through the Natural Gasoline Association of America, 305 Tulsa Bldg., Tulsa.

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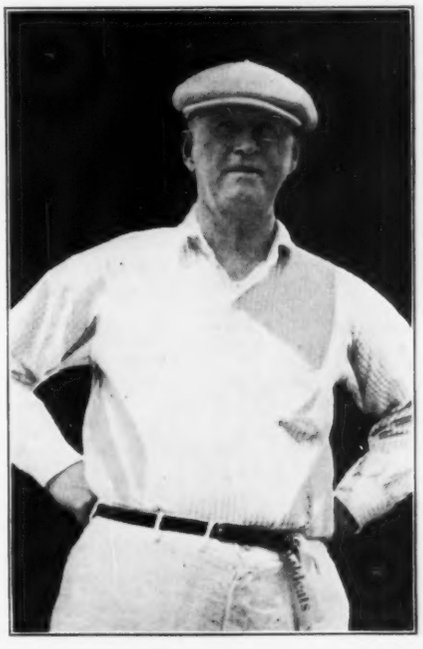
NEW YORK, Dec. 27.—The American Petroleum Institute has issued a booklet describing its work, entitled "What Does the Institute Do?" The booklet contains the speech of President E. B. Reeser before the Institute in Chicago. Copies may be obtained free of charge from the Institute, 250 Park Ave., New York.



*A. D. Sloan*

# Completions in Oklahoma and Kansas, Week Ended December 28, 1929

## OKLAHOMA

### Carter County

| Company | Well No. | Location | Depth | Init. Prod. |
|---|---|---|---|---|
| Ven-Mex | 1 | SEc NW 30-1-3 W | 2769-2847 | 270 |
| Magnolia | 2 | NE NW SE 23-1-3 W | 2312-2505 | 25 |
| **Cotton County** | | | | |
| Shasta | 11 | NWc NE 2-2-10 W | 2136-2157 | 200 |
| Shasta | 10 | CNL NW NE 2-2-10 W | 2147-2153 | 125 |
| Franklin | 6 | CWL SW SE 35-1-10 W | 2149-2166 | 30 |
| **Creek County** | | | | |
| Texas-Pacific | 1 | SEc NE 21-17-9 E | 2904-2924 | 10 |
| Jackson-Wise | 1 | NE SE SE 20-18-9 E | 2849-2869 | 280 |
| Gled | 1 | NW SE SW 25-19-8 E | 2205-2207 | 8 |
| Skelly et al | 1 | SWc 23-17-9 E | T.D. 3242 | Dry |
| Sherry et al | 2 | NEc NW 24-19-9 E | T.D. 2770 | Dry |
| Texas | 1 | NWc SW NW 26-16-10 E | T.D. 3142 | Dry |
| Sherry et al | 1 | SWc NW 12-15-9 E | T.D. 3415 | Dry |
| **Grady County** | | | | |
| Magnolia | 4 | NE NW SE 35-5-8 W | T.D. 2860 | 7M |
| **Grant County** | | | | |
| Continental | 2 | CWL NW NE 2-27-3 W | 4115-4246 | 9½M |
| **Hughes County** | | | | |
| Pine | 1 | NWc 17-5-8 E | 2577-2603 | 405 |
| Troutt Drlg | 2 | SW NE NW 5-8-11 E | 1579-1588 | 5M |
| Magnolia | 6 | SE SW NW 17-5-8 E | 2820-2825 | 20M |
| **Jefferson County** | | | | |
| Bridwell | 2 | SE SW NW 29-6-5 W | T.D. 2086 | Dry |
| **Kay County** | | | | |
| De Camp et al | 1 | C SW NW 30-28-1 E | T.D. 1200 | Dry |
| **Kiowa County** | | | | |
| Connor-Son | 3 | SEc SW NE 25-7-16 W | T.D. 648 | Dry |
| Alexander et al | 1 | SWc NW SW SW 17-6-16 W | T.D. 468 | Dry |
| **Logan County** | | | | |
| Cosden Inc | 3 | SE NE NW 31-19-4 W | 5945-5990 | 2355 |
| Cosden Inc | 4 | SEc NW 31-19-4 W | 6002-6031 | 1625 |
| **Marshall County** | | | | |
| Carter | 2 | SW NW NW 30-5-6 E | 596-616 | 75 |
| Bilbo | 1 | SE NW NW 24-5-5 E | 570-600 | 110 |
| Cox-Hamon | 1 | SWc NW SW SW 13-5-5 E | 504-573 | 60 |
| Bilbo | 2 | SEc SW NE NE 14-5-5 E | T.D. 729 | Dry |
| **Muskogee County** | | | | |
| Sessions et al | 1 | SEc SW 29-13-19 E | T.D. 1175 | Dry |
| Davis | 1 | NW SW SE 12-13-18 E | T.D. 985 | Dry |
| Mills et al | 2 | NW SE SE 15-13-18 E | 644-667 | ¾M |
| Arthur | 1 | SE NE NW 34-15-18 E | 827-836 | ¼M |
| Aggas | 2 | NE SE SW 28-16-15 E | 1412-1436 | 65 |
| **Okfuskee County** | | | | |
| Jarvis-Holm | 2 | NW NE NW 21-10-11 E | 2591-2598 | 75 |
| **Okmulgee County** | | | | |
| Hennessey | 1 | NE SE SW 9-13-14 E | 1781-1798 | 15 |
| Prince et al | 7 | SE NW NE 12-14-14 E | T.D. 1418 | 7 |
| Wheeler-Evans | 2 | SE NE SW 34-14-11 E | T.D. 3143 | Dry |
| Campbell-Cochran | 1 | NEc 19-15-13 E | T.D. 2778 | Dry |
| **Osage County** | | | | |
| Peters et al | 2 | NE SE NW 28-21-11 E | T.D. 2437 | Dry |
| Peters-Prod. & Ref. | 3 | NE SE SW 22-27-11 E | 1645-1658 | 30 |
| Peters | 1 | NEc NW 27-27-11 E | 1662-1684 | 80 |
| Oliphant et al | 5 | NE SW NW 6-23-9 E | 2065-2132 | 25 |
| Midco | 18 | NW NE SE 18-22-10 E | 1916-1936 | 20 |
| **Pontotoc County** | | | | |
| Universal | 3 | NW SE SW 25-5-6 E | 1990-1994 | 8M |
| Dixie | 1 | NWc SW 32-5-5 E | 2454-2540 | 144 |
| Benedum-Trees | 2 | NW SE NE 31-5-5 E | 2499-2628 | 100 |
| Empire | 4 | NE SE NW 19-5-5 E | 2328-2355 | 45 |
| American | 4 | SWc SE 19-5-5 E | 2340-2460 | 60 |
| Dixie | 1 | SEc 13-5-4 E | 2380-2631 | 40 |
| **Pottawatomie County** | | | | |
| Gypsy | 1 | SE NE NW 7-7-4 E | 3992-4050 | 250 |
| Magnolia | 1 | NEc 11-7-4 E | 3725-3880 | 25 |
| Shell | 4 | SE SW NW 9-8-5 E | 4031-4036 | 367 |
| Shell | 3 | SW SE NW 9-8-5 E | 4183-4188 | 680 |
| **Seminole County** | | | | |
| Mid-Continent | 16 | SW SE SE 7-5-8 E | 4065-4117 | 50 |
| Texas | 3 | NW SE SE 23-5-7 E | 2620-2645 | 65M |
| I. T. I. O. | 2 | NWc SW 13-5-7 E | 4302-4314 | 420 |
| Hoffman et al | 1 | SEc SW 24-5-5 E | 2732-2825 | 17 |
| Carter | 2 | NW SW SW 7-6-8 E | 4185-4189 | 985 |
| Sinclair | 5 | NWc SE 7-6-8 E | 2860-2900 | 65 |
| Sinclair | 6 | NE NW SE 7-6-8 E | 2846-2886 | 5M |
| Sinclair | 2 | SE NE SW 18-9-7 E | 4203-4215 | 705 |
| Minnehoma | 3 | NWc 17-9-6 E | 4200-4225 | 2854 |
| Burke-Greis | 4 | SE SW SW 17-9-6 E | 4251-4257 | 65 |
| Ligon et al | 1 | NWc SE 25-8-7 E | 3087-3119 | 35 |
| Sinclair | 1 | SEc NW 13-6-7 E | T.D. 4518 | Dry |
| **Stephens County** | | | | |
| Medlin et al | 1 | CSL N½ S½ NW 19-2-7 W | T.D. 1922 | Dry |
| Pace-Texhoma | 6 | NEc SW SW 2-2-8 W | T.D. 2500 | Dry |
| Pelwin | 1 | NWc NE SE NE 5-2-8 W | 2217-2225 | 50 |
| Pace-Texhoma | 5 | SEc NW SW 2-2-8 W | 2168-2175 | 17 |
| Ven-Mex et al | 3 | SWc SE SW SE 35-1-8 W | 2219-2221 | 18 |
| Armour et al | 5 | NWc SW 32-1-8 W | 2211-2218 | 10 |
| **Tulsa County** | | | | |
| Martin et al | 1 | NWc SW 27-17-13 E | 1981-1996 | 15 |
| Lockhart et al | 1 | CSL SE SW 28-17-14 E | T.D. 1370 | Dry |
| Keener | 1 | NWc SW NW 9-16-13 E | T.D. 2116 | Dry |

## KANSAS

### Butler County

| Company | Well No. | Location | Depth | Init. Prod. |
|---|---|---|---|---|
| Empire | 92 | NW SW NE 20-26-5 E | 2460-2485 | 305 |
| Empire | 91 | NW NE SW 20-26-5 E | 2526-2613 | 50 |
| Empire | 90 | SE SW NE 20-26-5 E | 2514-2595 | 40 |
| Straub-Dutton et al. | 1 | SE SW SW 12-28-3 E | T.D. 2983 | Dry |
| Lario | 1 | SWc SE 7-27-4 E | T.D. 3032 | Dry |
| **Coffey County** | | | | |
| Johnson et al | 1 | SE NE SW 23-21-13 E | T.D. 1868 | Dry |
| **Cowley County** | | | | |
| Shawver et al | 1 | NWc SE 23-32-3 E | T.D. 3543 | Dry |
| **Elk County** | | | | |
| Ramsey et al | 1 | SWc SE 3-31-8 E | T.D. 1936 | Dry |
| **Ellsworth County** | | | | |
| Texas | 1 | NEc SW 16-17-6 W | T.D. 4042 | Dry |
| **McPherson County** | | | | |
| Perry et al | 1 | C SE 20-19-4 W | T.D. 2917 | Dry |
| Shell | 1 | SWc SE 1-20-2 W | 2964-2965 | 3245 |
| Mid-Kans | 1 | NE NW NE 9-21-3 W | 3274-3286 | 1535 |
| **Morris County** | | | | |
| Arrow | 1 | C NW NE 8-16-7 E | T.D. 1470 | Dry |
| **Sedgwick County** | | | | |
| Johnson | 1 | SWc SE SW SW 2-27-1 W | T.D. 3519 | Dry |
| Moore et al | 1 | NE SE NW 18-28-1 W | T.D. 3682 | Dry |
| Shell | 3 | SW SE SE 15-26-2 E | T.D. 3237 | 188 |
| Shell | 2 | NW SW SW 14-26-2 E | 3352-3354 | 265 |

# Completions in California, Week Ended December 21, 1929

### Sante Fe Springs

| Company | Well No. | Location | Depth | Init. Prod. |
|---|---|---|---|---|
| General Pet. Corp. | 179 G | .... | 8070 | 6500 |
| Getty, George F | Mitchell 28 | .... | 7982 | 1929 |
| Getty, George F | Nordstrom 39 | .... | 8118 | 4975 |
| Union Oil Co | Bell 38 | .... | 8000 | 4350 |
| Union Oil Co | Howard 9 | .... | 7985 | 3500 |
| **Long Beach** | | | | |
| Allied Pet. Corp | Buster Keaton 2 | .... | 7251 | 300 |
| Apex Petroleum Corp. | No. 16-A | .... | 7950 | 2250 |
| Deeds K. S. | No. 5 | .... | 6925 | 400 |
| Bowles Oil Co | Robert 4 | .... | 7378 | 740 |
| Dabney Oil Co | Murchison 1 | .... | 6818 | 40 |
| Dabney-Johnson Oil Co. | No. 19 | .... | 7024 | 60 |
| McMillan Petroleum Corp. | Beck 4 | .... | 7525 | 800 |
| **Maricopa Flats** | | | | |
| California Western Oil Co. | Havenstrite 4 | .... | 3230 | 2500 |
| Doyle Petroleum Corp. | Son-Crail 1 | .... | 3500 | 2500 |
| North American Consolidated Oil Co. | Sunset 5 | .... | 3346 | 180 |
| Rio Grande Oil Co | Havenstrite 2 | .... | 3491 | 3500 |
| Signal Oil and Gas Co. | Wallace 4 | .... | 2686 | 650 |
| **Summerland** | | | | |
| Getty, George F | No. 16-1 | .... | 1570 | 180 |

# New Field Operations in Oklahoma, Kansas, North, North Central, East Central, Panhandle and West Texas, Week Ended December 28, 1929

## OKLAHOMA

### Carter County

| Company | Well No. & Farm | Location |
|---|---|---|
| Magnolia | 4-Denny | SW NE NE 30-1-3 W |
| **Cotton County** | | |
| Medlin | 1-Johns | SWc SE 8-2-9 W |
| Shasta | 12-Slogan | NEc 2-2-10 W |
| Shasta | 3-Burneaugh | SEc NW NW SE 2-2-10 W |
| **Creek County** | | |
| Texas Pacific | 9-Harjoche | NE SE NE 21-17-9 E |
| Jackson-Wise | 1-McIntosh | NW NE NW 28-18-9 E |
| Bailey et al | 1-Foster | NWc NE 19-19-9 E |
| **Garfield County** | | |
| Shell et al | 1-Loomis | C NW NW 32-23-4 W |
| **Grady County** | | |
| Magnolia | 10-Smith | SEc SW NE 35-5-8 W |
| **Grant County** | | |
| Continental et al | 4-Frantz | C NW SE 35-28-3 W |
| **Hughes County** | | |
| Mid-Continent | 1-Buck | SW NE NW 28-9-10 E |
| Magnolia | 1-Jackson | SE SW NE 17-7-8 E |
| **Jefferson County** | | |
| Beck | 6-Seay | NWc NE SE SW 34-6-5 W |
| **Marshall County** | | |
| Magnolia | 1-Coatsworth | SWc SE SE SE 30-5-5 E |
| Goddard | 1-Marshall | NWc NE NE SW 30-5-6 E |
| Goddard | 3-McComas | NWc SW SW SW 13-5-5 E |
| Burroughs-Dennis | 1..... | SWc NW SW 13-5-5 E |

### Muskogee County

| Company | Well No. & Farm | Location |
|---|---|---|
| Ray et al | 1-Montgomery | SEc 15-13-18 E |
| **Oklahoma County** | | |
| I. T. I. O. et al | 8-Jones | NW NE NW 31-11-2 W |
| I. T. I. O. et al | 7-Jones | NE NW NW 31-11-2 W |
| Skelly | 4-Hoopes | SE NW NE 31-11-2 W |
| Slick | 4-Hoopes | NE SW NE 31-11-2 W |
| Slick | 3-Hoopes | SE SW NE 31-11-2 W |
| Sinclair | 2-Vencl | NE NW SE 31-11-2 W |
| I. T. I. O. et al | 7-Emmerson | SE SW SW 30-11-2 W |
| I. T. I. O. et al | 6-Emmerson | SW SE SW 30-11-2 W |
| I. T. I. O. et al | 1-George | SWc 7-11-2 W |
| Coline | 9-Olds | SWc NW 24-11-3 W |
| I. T. I. O. et al | 1-Warner-Farley | NEc SE 23-11-3 W |
| I. T. I. O. et al | 14-Trosper | SEc NE 14-11-3 W |
| I. T. I. O. et al | 1-Unsell | SEc NE 23-11-3 W |
| Mid-Kansas et al. | 2-Mollman | NW SE SE 23-11-3 W |
| Coline | 7-Warren | NE SW SW 18-11-2 W |
| **Osage County** | | |
| Vacuum | 3..... | SE NE NE 22-26-6 E |
| Oliphant | 1..... | SW SE NW 12-26-8 E |
| Peters | 1..... | SEc NW 27-25-9 E |
| Continental | 1..... | NW SE SE 24-24-5 E |
| Brandstetter et al. | 7..... | NW SE SE 22-22-11 E |
| **Pawnee County** | | |
| Thompson-Black | 1-Bayless | NEc 30-20-9 E |

(Continued on Page 45)

# New Field Operations in Oklahoma, Kansas, North, North Central, East Central, Panhandle and West Texas, Week Ended December 28, 1929

(*Continued from Page 44*)

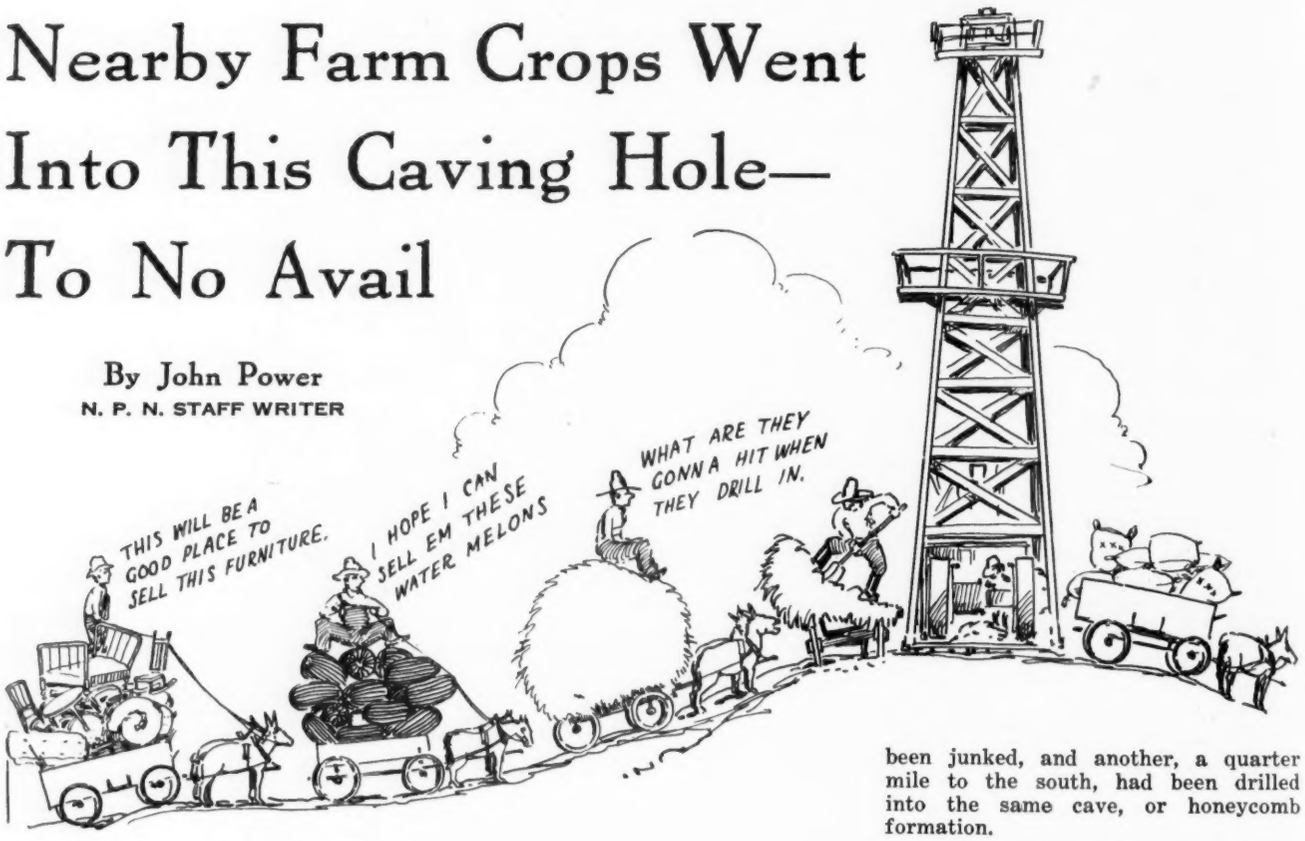
| Init. Prod. | Company | Well No. & Farm | Location | |
|---|---|---|---|---|
| | **Payne County** | | | |
| 100 | Magnolia | 5-Payne | SE NE NE 6-17-4 E | |
| 45 | Shaffer | 7-Sharrum | NW SW NW 5-17-4 E | |
| 60 | **Pontotoc County** | | | |
| 40 | Benedum-Trees | 2-Bullard | NW SE NW 31-5-5 E | |
| 250 | Texas-Pacific | 2-Hatcher | NE NW NE 30-5-5 E | OWD |
| 25 | Benedum-Trees | 1-Holmdy | SE SW SW 27-5-5 E | |
| 367 | Homaokla | 1-Buxby | NEc NW 3-4-8 E | |
| 680 | **Pottawatomie County** | | | |
| 50 | Gypsy | 1-Duvall | NWc SW 3-7-4 E | |
| 65M | Mid-Continent | 1-McGee | SWc NW 3-7-4 E | |
| 420 | Pure | 2-Duvall | NEc SE 4-7-4 E | |
| 17 | McEwen-Walker | 1-Townlot | SE SW NW 8-9-5 E | |
| 985 | Magnolia | 5-Billington | NW NE NW 22-7-4 E | |
| 65 | Magnolia | 3-Hilton | SW NW NW 22-7-4 E | |
| 5M | Twin State | 1-Curley | SW NW NE 22-7-4 E | |
| 705 | Sinclair | 2-Morgan | NE NW SW 4-7-4 E | |
| 2854 | Twin State | 1-Norma | SE SW NW 4-7-4 E | |
| 65 | Anderson et al | 1-Strain | NWc NE 17-9-5 E | |
| 35 | **Seminole County** | | | |
| Dry | Mid-Continent | 1-Harjoche | SE NW SE 8-6-6 E | |
| Dry | Gypsy | 3-Harjo | SW NW SE 18-9-7 E | |
| Dry | Continental et al | 4-Perry | NW SE SW 18-9-7 E | |
| 50 | Carter | 5-Chowning | SWc 19-9-6 E | |
| 17 | Mid-Continent | 3-Yarhola | NE SW NE 8-7-7 E | |
| 18 | Magnolia | 3-Brame | SW NE NE 8-7-7 E | |
| 10 | Magnolia | 2-Cudjo | NW NE NE 24-7-6 E | |
| | Gypsy | 4-Willie | SE NW NE 24-7-6 E | |
| 15 | Gypsy | 3-Willie | NE NW NE 24-7-6 E | |
| Dry | Gypsy | 1-Carolina | SW SE NE 13-7-6 E | |
| Dry | Magnolia | 2-Coker | SE SW SE 13-7-6 E | |
| | Sinclair | 2-Davis | NEc SW 7-6-8 E | |
| | Carter | 3-Spillman | SW NW SW 7-6-8 E | |
| | Champlin et al | 1 | NW SW SW 9-6-6 E | |
| 305 | Magnolia | 4-Reed | NEc SW 13-5-7 E | |
| 50 | **Sequoyah County** | | | |
| 40 | Western Okla | 1-Barnes | NEc SW NE 33-11-25 E | |
| Dry | **Stephens County** | | | |
| Dry | Magnolia | 11-Burke | SEc SW NE 34-1-8 W | |
| | Magnolia | 27-Kagay | SWc NW SW 34-1-8 W | |
| Dry | Magnolia | 6-Worrell | SEc SW NW 19-1-8 W | |
| | **Wagoner County** | | | |
| Dry | Bremer et al | 1-Lewis | NWc SW NE 31-18-18 E | |
| | Keener | 1-Vermillion | NW NE NW 3-16-19 E | |
| Dry | **KANSAS** | | | |
| | **Butler County** | | | |
| Dry | Shell | 1-Harper | SWc NE 35-26-3 E | |
| Dry | **Chautauqua County** | | | |
| 3245 | Theta | 2-Julien | NE SE NW 12-32-10 E | |
| 1535 | **Chase County** | | | |
| | Chase County Pipe Line | 1-Miller | C SW 21-19-6 E | |
| Dry | Urshell et al | 1-Lipps | C SW SW 27-18-6 E | |
| | **Cowley County** | | | |
| Dry | Wilson et al | 1-Peacock | NWc SE 36-32-4 E | |
| Dry | Mead et al | 1-Tatum | SEc SW 11-31-6 E | |
| 188 | **Dickinson County** | | | |
| 265 | Morgan et al | 1-Whitehair | NWc SE 9-12-1 E | |
| | **Greenwood County** | | | |
| | McCulloch et al | 1-Gaffner | SW NW NW 12-24-10 E | |
| | Empire | 5-Patterson | SW SE SE 36-23-11 E | |
| | **McPherson County** | | | |
| Init Prod | Sinclair | 3-Voshell | NW SW NW 10-21-3 W | |
| 800 | Mid-Kansas | 1-Pitts | C SW SE 2-19-2 W | |
| | Texas | 1-Stuckey | NW SW SW 10-21-3 W | |
| | Marland Inc. et al | 1-Krehbiel | NW SW SE 10-21-3 W | |
| | **Morris County** | | | |
| | Snyder et al | 1-Drumond | C NW SE 21-17-7 E | |
| 2500 | Urshell et al | 1-Scott | NEc SW 6-16-6 E | |
| 2500 | **TEXAS** | | | |
| 180 | **Anderson County** | | | **Survey** |
| | Humble | 1-Gammill | | Cannon |
| 3500 | Humble | 1-Cook | | Patton |
| 650 | Humble | A4-Jones | | Roberts |
| | Roser-Pendleton | 1-Moody Est. | | Welch |
| | **Brown County** | | | |
| 180 | Smith | 14-George | Sec-42 | Chaddick |
| | Arcadia | 1-Trueheart | Blk-638 | Lamar |
| ndle | Paramount | 1-Brooks | Blk-350 | Hermandez |
| | Gordon | 6-Cannon | Blk-3 | Arenbeck |
| | Warren | 4-Trueheart | Blk-638 | Lamar |
| | McGahkey et al | 1-Mullins | | Mullins |
| | McGahkey et al | 2-Mullins | | Mullins |
| | Owens Inc | 2-Whiteside | Blk-627 | Banister |
| | Anderson et al | 1-Fuller | Blk-353 | Jennings |
| | Donnelly-Duffey | 1-George | Sec-42 | Chaddick |
| | Young Bros.-Alexander-Woodley | 24-Hickman | Blk-801 | McGloin |
| | Texas | 6-Johnson | | Nix |
| | **Callahan County** | | | |
| | Ewmo | 8-Beasley | Sec-25 | D&DA |
| | Dickey Bros | 3-Williams | Sec-25 | D&DA |
| | Campbell | 1-Jackson | Sec-10 | ET |
| | Campbell | 1-Cutbirth et al. | Sec-208 | Garcia |
| | Jackson et al | 1-Jones | Blk-2 | Anderson |
| | Schaefner | 6-Cowan | Sec-74 | Comal Co. Sch. Ld. |
| | Campbell | 1-Alexander | Sec-117 | BBB&C |
| | Kleiner | 1-Miller | Sec-143 | GH&H |
| | Mook Texas | 1-Harris | Sec-112 | BBB&C |
| | Transcontinental | 1-Bowman | Sec-70 | BBB&C |
| | Bailey et al | 1-Finley | Sec-65 | BOA |
| | Mundy | 1-Harp | Sec-11 | D&DA |
| | **Cherokee County** | | | |
| | Humble | 5-Earle et al. | | Johnson |
| | **Coleman County** | | | |
| | Smith | 10-Morris | Blk-483 | Woods |
| | Homaokla | 1-Sealy et al. | Sec-59 Blk-1 | GH&H |
| | Kidney-Kamon-Western Explor. | 2-Pfluger | Blk-280 | Skirlock |
| | Roth-Faurot | 5-Stevins | Blk-57 | Coleman Co. Sch. Ld. |
| | Tidal | 2-Stewardson | Sec-91 | ET |

| Company | Well No. & Farm | Location | |
|---|---|---|---|
| **Comanche County** | | | |
| Lone Star | 1-Frost | | Martin |
| **Eastland County** | | | |
| Hoffman Page & Co. | 6-Harbin | Sec-27 Blk-2 | H&TC |
| Morris Bros | 1-Williams | | Frells |
| **Freestone County** | | | |
| Killam-Phillips | 1-Killam | | Sanchez |
| **Grimes County** | | | |
| Mayfield et al | 1-Rossi | | BBB&C |
| **Hill County** | | | |
| Mayhaw-Pennington | 2-Nelson | | Franks |
| **Jack County** | | | |
| Tedford Bros | 1-Maxey | Sec-2 | SP |
| Shaw | 5-Box | | Hughson |
| Boler et al | 3-Raley | | Hughson |
| Shaw | 6-Box | | Hughson |
| F. H. E. Oil Co | 1-Boyd Bros. | Sec-1 | SFIW |
| **Limestone County** | | | |
| Ursy et al | 1-Anglin | | Varela |
| **Palo Pinto County** | | | |
| Richardson et al | 1-Holt | | Lewis No. 10 |
| Proffit et al | 1-Dalton | Sec-1787 | TE&L |
| Mingus | 1-Slemmons | Sec-45 Blk-3 | T&P |
| Texas Pacific | 163-Stuart-Sons | Sec-71 Blk-4 | T&P |
| **Shackleford County** | | | |
| Carter Dev | 2-Nail | Sec-52 | ET |
| Ducker et al | 2-Mathews | Sec-584 | TE&L |
| Cleveland Prod | 1-Hastings | | Swenson No. 18 |
| Morton | 1-Davis | Sec-39 Blk-12 | T&P |
| Hart-Wright | 4-Clack | Sec-2 | BWL |
| Wort Pet | 1-Clark | Sec-2 | BWL |
| **Upshur County** | | | |
| Wilburn et al | 1-Hudspeth | | Dearmore |
| **Van Zandt County** | | | |
| McElmurry et al | 1-Peel | | Meek |
| Thornton & Taube | 1-Evans | | Carslile |
| **NORTH TEXAS** | | | |
| **Archer County** | | | |
| Burns | 8-Turbeville | Blk-152 | Carson |
| Shasta | 7-Meade Est. | Blk-39 | Meade |
| Lawson-Duke | 3-Richardson | Sec-2425 | TE&L |
| Ramming-Wilson | 1-Richardson | Blk-12 | Scott |
| Cullum et al | 1-Richardson | Blk-15 | Scott |
| Burns | 1-Collins | Blk-33 | Meade |
| Douglas et al | 1-Dunham | Sec-2436 | TE&L |
| Hunter | 1-Kunkel | | Sanderford |
| **Baylor County** | | | |
| Consolidated | 6-Portwood | Sec-1281 | TE&L |
| **Kent County** | | | |
| Atlantic et al | | Sec-60 Blk-G | W&NW |
| **Montague County** | | | |
| Barnsdall | 3-Cunningham | | Norton |
| Bridwell | 1-Dennis | | Robertson |
| Continental | 27-Howard | | Chambliss |
| Bridwell-Cont | C3-Salmon | | Edmondson |
| **Throckmorton County** | | | |
| Cranfill-Reynolds | 6-Lee | Sec-198 | BBB&C |
| **Wilbarger County** | | | |
| Texas | 372-Waggoner | Sec-33 Blk-4 | H&TC |
| Texas | 371-Waggoner | Sec-39 Blk-4 | H&TC |
| Fain-McGaha | L18-Waggoner | Sec-31 Blk-4 | H&TC |
| Lido | C4-Waggoner | Sec-50 Blk-2 | H&TC |
| Zenith | 2-Dill | Sec-82 Blk-14 | H&TC |
| Martin | 2-George | Sec-29 | Poitevent |
| Grayback Dev | 1-Waggoner | Sec-52 Blk-2 | H&TC |
| **Young County** | | | |
| Reed-Wooten | 2-Fisher | Abstract-1477 | Lemmons |
| Sun | 19-Kunkel | Sec-4 | BBB&C |
| Burns-Long | 1-Vernon | Abstract-1874 | Neeley |
| Lawson | 1-Laberman | Sec-151 | TE&L |
| Anderson | 1-Castleman | Sec-72 | TE&L |
| Stump-Heydrick | 1-Daniels | Sec-164 | TE&L |
| Bolin-Lindsey | 2-Wolf | Sec-165 | TE&L |
| Goldsmith-King | 9-Kunkel | | Stell |
| Goldsmith-King | 8-Kunkel | | Stell |
| Perkins-Cullum | 4-Deitrich | | Stell |
| Petroleum Prod | 9-Hennig | Sec-410 | TE&L |
| Pardue-Baker | 2-Donnell | | Donnell |
| Texas Pacific | 7-Donnell | Sec-1211 | TE&L |
| Mid-Texas | 4-Childress et al. | | Morgan |
| Pennel Bros. et al. | 1-McLaren | | Conner |
| Shaw Inst. | 2-Jarnagin | | Conner |
| Shaw Inst | 1-Kisinger | Lot-2 | Conner |
| Cunningham | 2-Kisinger | | Conner |
| Fultz et al | 1-Kisinger | Lot-1 | Conner |
| Christie Bros | 1-Kisinger | | Conner |
| Long et al | 1-Williams | Abstract-1278 | Woolfork |
| Bolin-Lindsey | 1-Perry | Abstract-24 | Brown |
| **PANHANDLE** (Not Reporting) | | | |
| **WEST TEXAS** | | | |
| **Crane County** | | | |
| Church-Weekly | 6-Duoll Univ. | Sec-39 Blk-30 | Univ. |
| Magnolia | 18-Univ. | Sec-39 Blk-30 | Univ. |
| **Ector County** | | | |
| Llano | 1-Hogan | Sec-18 Blk-44 | T&P |
| **Fisher County** | | | |
| Cranfill-Reynolds | 1-Bledsoe | Sec-200 Blk-1 | BBB&C |
| **Howard County** | | | |
| California | 10-Roberts Lse. No. 2 | Sec-156, Blk-29 | W&NW |
| **Pecos County** | | | |
| Mid-Kansas-Transc | 8-Smith | Sec-31 Blk-194 | TC |
| Frates at al | 1-White et al. | Sec-29 Blk "Z" | TC |
| Taylor-Link | 12-Univ. | Sec-13 Blk-18 | Univ. |
| **Upton County** | | | |
| Texas Pacific | 1-Lane | Sec-36 Blk-1 | MK&T |
| **Ward County** | | | |
| Grand Falls | 1-Boogher et al. | Sec-11 Blk-5 | H&TC |

(*Tables Continued on Page 48*)

# Nearby Farm Crops Went Into This Caving Hole—To No Avail

By John Power
N. P. N. STAFF WRITER


THIS WILL BE A GOOD PLACE TO SELL THIS FURNITURE.
I HOPE I CAN SELL EM THESE WATER MELONS
WHAT ARE THEY GONNA HIT WHEN THEY DRILL IN.

TULSA, Dec. 28

THE driller on the Shaffer et al. No. 1 Crowell was in trouble. Drilling mud would go into the hole but it wouldn't come out. He spat a wad of eating tobacco into the return box, and called for more pressure on the pumps. And still no returns came to the surface.

The driller took a fresh chew, and swore, not softly, but earnestly, and with a nice attention to detail, after the manner of one who wonders why, out of all the professions open, he should have chosen rotary drilling.

The well wasn't very deep as yet, only around 800 feet. But already it had shown symptoms of developing into one of those hard luck wells that make contracting a profession only for those who have "poise under pressure."

Two men of the drillers' crew had been killed on the well when the gypsum water had clogged a boiler and caused it to blow up. Good men, they had been, too, like all the members of his crew. It wasn't their fault that this double damned hole in the ground was like to break his heart. He had a reputation as a hole maker to sustain, and how can a man make hole when he can't get circulation?

Maybe the cave could be cemented off. The driller had tried that before. But no luck, even after 4400 sacks of cement had been run in. And then 900 barrels of lime, and 300 wagon loads of red clay went to join the cement in the cavity which swallowed everything that was put into it as unconcernedly as the whale swallowed Jonah.

The contractors, Summit Drilling Co., didn't like the idea of losing a hole, particularly one which was being held up by nothing more serious than a cave, the likes of which they had whipped often enough before. "Why, caves have to have walls somewhere, they can't just go on forever," they said.

The farmers of the community were called on for their surplus fodder, and crops which had been planted to feed livestock were used to feed an appetite which was to prove harder to satisfy, but much less profitable, than any cow that ever lived.

Came farm relief, and in a big way. Five hundred bushels of oats were put down the hole; and then 20 tons of cotton seed hulls, 180 bushels of corn, 180 bushels of bran, and 20 tons of ensilage followed in short order. And they couldn't even raise the water level.

Although the cave, and the trouble it caused, might have had its funny side at first, the humor began to play out, along with the drillers' and contractors' patience. It was decided to ream out the hole, and by drilling dry, to make enough hole below the bottom of the honeycomb to set some 12½-inch pipe through the cave, cement it in place, and continue the drilling through the pipe.

Eventually, this proved to be the thing. But not until one hole had been junked, and another, a quarter mile to the south, had been drilled into the same cave, or honeycomb formation.

It was necessary to ream out the hole that had been made to get the 12½-inch down. While the bit was running in the cave there were times when it would drop as much as 11 feet without touching a thing. And this after all the cement, grain, and by-products for miles around had been dumped into the hole.

Running 12½-inch through the 15-inch surface pipe, set at 390 feet, proved to be rather tight work. The 12½-inch had to be manhandled so much by the crew that it twisted off in the cave. And with that, everybody laughed heartily, and called it a junked hole. At least, they junked the hole.

But the contractors had agreed with the Shaffer Oil & Refining Co. and the Peerless Oil & Gas Co. and some others to drill a test in that neck of the woods to a depth of 6000 feet or so, unless, of course, a commercial well was found at a lesser depth. So the rig was skidded a quarter mile south, and a new hole started.

THIS time 20-inch surface pipe was set, at 120 feet. At about the same depth as in the first hole the cave showed up, but this time there was no horseplay attempted. Preparations were made immediately to make some hole dry, below the cave, and to set 15-inch casing to shut it off.

The cave, or crevice, was logged from 780 to 910 feet. The hole was drilled dry to a total depth of 1125, and reamed out to a 19-inch hole as far as 1093 feet. Ten hundred and 74

feet of 15-inch pipe was run, with the water standing in it to within 347 feet of the top.

The first attempt at cementing didn't get a job. The mix had been pretty thin, and had been pumped to within 30 feet of bottom. When the swage nipple on top of the casing was opened after the cement had been given time to set, air was sucked into the hole, indicating that the water left on top of it was going down.

The first mix having been too thin to set, and there being so little fluid outside of the pipe to balance the pressure of the fluid inside, all the cement in the hole was pushed out through the shoe, up between the wall of the hole, and in all probability on into the crevice.

The next time cementing was tried the water/cement ratio was kept lower, and great care was taken to keep the pressure inside and outside of the pipe equalized. And this time they got a cement job.

And unless this hoodoo well develops further trouble, the grief is apparently over, for the drilling report reads, for the first day after starting up to drill out the plug "Drilled out cement, cleaning out on bottom. Circulation good."

In calculating the pressures which had to be equalized, it was figured that there were 164 feet between the casing shoe and the bottom of the crevice. Further calculations showed that by using 500 sacks of cement, with 4½ gallons of water per sack, there would be a 358-foot plug of cement in the casing.

Computing the weight of the cement which could be forced back of the pipe, and up the hole as far as the bottom of the crevice, it was determined that an 85-foot plug of cement would remain inside the casing when the two fluid columns were perfectly balanced.

Extreme care was taken to keep the water cement ratio at the predetermined amount. A setting accelerator was used, and the cement given 92 hours to harden. Harden it did, and, as has been told, at last reports, the Shaffer, Peerless et al. No. 1 Crowell was drilling ahead, at 1800 feet, and with "circulation good."

# Watching the Mid-Continent From an Easy Chair

Staff Special

BARTLESVILLE

WHEN officials of the Phillips Petroleum Co., at Bartlesville, feel it necessary to recall past developments, or to visually contemplate current activities in the Mid-Continent, they have but to step into their own map room. Before the largest map of its kind in the world, they may sit at ease and refresh their memories.

It is not even necessary for them to turn a crank to review this vast territory. An electric motor slowly unrolls the myriad details of approximately 232,000 square miles. Bounded by the Nebraska-Kansas line on the north, the Mexican border on the south, on the east by Range 12 west in Oklahoma, and central Lea county, New Mexico on the west, the map takes goodly slices out of five states.

There is a satisfaction in the use of this map that is not present with those purchased outside the organization. It is more personal because it was prepared by Phillip's engineers after two years of hard labor.

The map is really a draftsman's crazyquilt, being a patchwork of 228 pieces carefully matched on a linen background. Of the 217 counties represented, most of them are shown in one piece. In Texas however, where everything comes big, including the counties, it was necessary to draw some of them in two sections.

The scale used in the preparation of this map was one inch to the mile, which is large enough to permit inclusion of all the desired detail. All wells drilled or drilling, their condition on being completed and the important depths are posted currently.

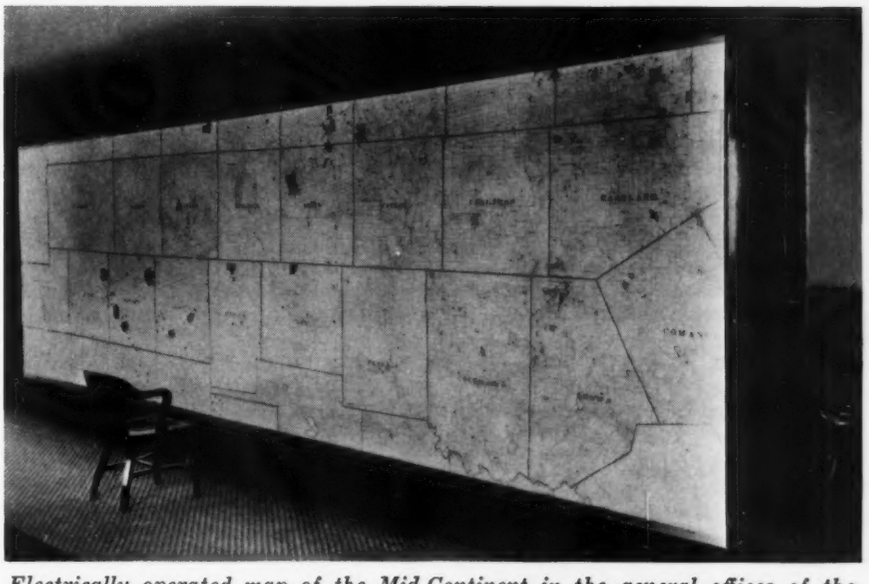
Ownership and leasing data is also included so that any movement of the industry in the area may easily be followed. This daily spotting and adding of information to a single map increases its value to the point where it can be listed as one of the company's important assets.

Mechanically the map is as near operating perfection as could be desired. Eight and one-quarter casing is used as rolls upon which to wind the 90 feet of covered linen. Four of these 25-foot rollers are required and all are mounted on roller bearings. They are geared to a five-horsepower motor at the right hand side of the steel frame which supports the whole cabinet. Connected to the motor is a drum switch permitting slow speeds forward or reverse. That the map is no toy is evidenced by the fact that the complete assembly, without the map, weighs approximately three tons.

At the ends of the same room are two other mechanically operated maps, drawn to a smaller scale, but covering larger areas. One of these is of particular interest in that it shows all the pipelines, refineries, railroads, drainage, and counties, from Nebraska south to the Rio Grande and from Arkansas west to New Mexico, inclusive. It is a valuable connection to the larger map and may be used to good advantage with it.

The cost of such map installations is reasonable when their true value to an organization is taken into consideration. The principal difficulty, preventing their wider use, probably lies in the space they require. The map room of the Phillips is 35 by 46 feet which is more room than most oil companies have to spare.

One company, the Skelly Oil, is making room in its new building in Tulsa. The new map it is installing is the same size and covers the same territory as that of the Phillips Petroleum Co.



*Electrically operated map of the Mid-Continent in the general offices of the Phillips Petroleum Co., at Bartlesville. It is 25 feet wide, 88 feet long and covers 232,000 square miles. The control switch may be seen on the right and the extension phone on the extreme left*

# Completions in Texas, Week Ended December 28, 1929

## NORTH CENTRAL & EAST CENTRAL

### Anderson County

| Company | Well Farm | Survey Sec. Blk. | Depth | Init. Prod. |
|---|---|---|---|---|
| Humble | 3-Jones | Roberts | 3471-3541 | 17 (1 Hr.) |
| Humble | 3-Jones | Roberts | T.D. 3724 | Dry |

### Brown County

| | | | | |
|---|---|---|---|---|
| Budee | 8-Munselle | Arenbeck Blk-3 | T.D. 1282 | Dry |
| Hart | 1-McHass | Duckworth Sec-17 Blk-56 | T.D. 2075 | Dry |
| Praskey et al. | 1-Evans | Woodward Blk-20 | T.D. 725 | Dry |
| Gordon | 5-Cannon | Arenbeck Blk-3 | 1188-1204 | 100 |
| Michael-Gibson-Johnson | 1-Hickman | Kinsey | 1249-1301 | 12 |
| Owens Inc. | 1-Whiteside | Banister Blk-627 | 1313-1322 | 42 |
| Smith | 30-George | Chaddick Sec-42 | 1303-1325 | 130 |
| Smith | 31-George | Chaddick Sec-42 | 1291-1315 | 150 |
| Young Bros.-Alexander-Woodley | 23-Hickman | McGloin Blk-801 | 1321-1330 | 120 |

### Callahan County

| | | | | |
|---|---|---|---|---|
| Grass Roots | 1-Clutts | Brown Blk-5 | T.D. 948 | Dry |
| Kleiner | 1-Morris | GH&H Sec-141 | T.D. 1007 | Dry |
| McCleary | 1-Hickman | I&GN | T.D. 573 | Dry |
| States | 1-Allen | BBB&C Sec-81 | T.D. 1756 | Dry |
| Ewmo | 7-Beasley | D&DA Sec-25 | T.D. 716 | Dry |
| Dickey Bros. | 2-Williams | D&DA Sec-24 | T.D. 735 | Dry |
| Dickey Bros. | D1-Williams | D&DA Sec-25 | T.D. 771 | Dry |
| Dickey Bros. | D2-Williams | D&DA Sec-25 | T.D. 750 | Dry |

### Coleman County

| | | | | |
|---|---|---|---|---|
| Atlantic-Urban et al. | 1-Gates | GH&H Sec-67 Blk-1 | T.D. 2852 | Dry |
| Taylor-Link | 2-Stewardson | ET Sec-91 | 1470-1477 | 32 |
| Texas American Synd. | 2-Newton | San Angustine Univ.Sec-1 Blk-519 | 318-3830 | 15½M |
| Tower-McKenna. | 1-Crowder | Woods Blk-483 | 2017-2020 | 30 |

### Concho County

| | | | | |
|---|---|---|---|---|
| Slick | 1-Mosley | Bachman Blk-1838 | T.D. 1282 | Dry |

### Eastland County

| | | | | |
|---|---|---|---|---|
| Barkley-Crotty | 2-Wright | Robinson | T.D. 3760 | Dry |
| Hopkins | 2-Jones | H&TC Sec-43 Blk-4 | T.D. 3935 | Dry |
| Bearman | 1-Kincaid | H&TC Sec-80 Blk-4 | 3488-3573 | 207 |
| Hoffman Page | 4-Foster | H&TC Sec-27 Blk-2 | 1285-1295 | 27 |
| Tex-Wa & Kirk. | 1-Murrell | H&TC Sec-30 Blk-2 | 1330-1347 | 8 |

### Hill County

| | | | | |
|---|---|---|---|---|
| McElmurry-Keitt | 2-Coates Est. | McDonald | T.D. 1330 | Dry |
| Harper-Laston | 4-Jones | Graves | T.D. 800 | Dry |
| Mayhaw-Pennington | 1-Nelson | Franks | T.D. 1275 | Dry |

### Jack County

| | | | | |
|---|---|---|---|---|
| Seaboard | 1-Enloe | Hughson | T.D. 3215 | Dry |
| Liedecker et al. | 1-Kuykendall | Hughson | T.D. 3219 | Dry |
| Christie Bros. et al. | 1-Morrow | Vandever | T.D. 3275 | Dry |
| Saxet | 1-Maxey Est. | SP Sec-2 | 452-460 | 40 |

### Palo Pinto County

| | | | | |
|---|---|---|---|---|
| Thomas | 2-Thomas | H&TN Sec-2 | 3418-3429 | 1½M |
| Burton & McGee | 7-Strawn Coal Co. | Ashworth | 2999-3014 | 2M |

### Shackleford County

| | | | | |
|---|---|---|---|---|
| French et al. | 1-Dawson et al. | ET Sec-182 | T.D. 1765 | Dry |
| Sedgwick | 2-Morris et al. | ET Sec-170 | T.D. 1697 | Dry |

### Stephens County

| | | | | |
|---|---|---|---|---|
| Nunn et al. | 1-Langford | T&P Sec-39 Blk-6 | T.D. 2200 | Dry |
| Grantor | 37-Swenson | OAL Sec-5 | 1786-1793 | 30 |
| Pace-Ward | 4-Norton | TE&L Sec-1218 | 3284-3323 | 1¾M |

## NORTH TEXAS

### Archer County

| | | | | |
|---|---|---|---|---|
| Douglas | 5-McClure | Crawford Blk-13 | 1286-1289 | 25 |
| Duke et al. | 1-Richardson | TE&L Sec-2425 | 1411-1417 | 135 |
| Golding-Cochran et al. | 2-Keche | Meade Blk-25 | 1426-1429 | 35 |
| Pandem | 1-Young | TE&L Sec-2426 | 1411-1415 | 130 |
| Reeder et al. | 6-Kunkel | BBB&C Sec-3 | 1161-1165 | 100 |
| Burns | 1-Dubose | Meade Sec-10 | T.D. 1445 | Dry |
| Burns | 4-Wilson | ATNCL Sec-115 | T.D. 1516 | Dry |
| Christie | 1-Kunkel | Stell | T.D. 1213 | Dry |
| Howell | 1-Miller | ATNCL Sec-19 Blk-1 | T.D. 1702 | Dry |
| M. & V. Oil Co. | 4-Lanster | BBB&C Sec-3 | T.D. 1195 | Dry |
| Sun | 10-Richardson | TE&L Sec-2425 | T.D. 1477 | Dry |
| Williams et al. | 3-Kunkel | McCoy Blk-4 | T.D. 1220 | Dry |

### Baylor County

| | | | | |
|---|---|---|---|---|
| Grisham-Barnsdall | 1-Portwood | TE&L Sec-1574 | T.D. 1502 | Dry |
| Consolidated | 3-Portwood | TE&L Sec-1281 | 1394-1405 | 125 |

### Clay County

| | | | | |
|---|---|---|---|---|
| Merrick-Belcher | 7-Bates | PCSL Blk-6 | 1748-1759 | 30 |
| Merrick-Belcher | 6-Bates et al. | PCSL Blk-6 | 1740-1762 P.B. 1488 | 20 |

### Cooke County

| | | | | |
|---|---|---|---|---|
| Kewanee | 1-West | Cheneworth | T.D. 1600 | Dry |

### Grayson County

| | | | | |
|---|---|---|---|---|
| Bell | 1-Cown | Grace | T.D. 655 | Dry |

### Montague County

| | | | | |
|---|---|---|---|---|
| Continental | 26-Howard | Chambliss | T.D. 1656 | Dry |
| Bridwell | 8-Salmon | Robertson | T.D. 1613 | Dry |
| Barnsdall | 2-Cunningham | Norton | 921-928 | 35 |
| Continental | 25-Howard | Chambliss | 993-1022 | 34 |
| Bridwell-Cont. | C1-Salmon | Edmondson | 1112-1117 | 54 |
| Bridwell-Cont. | C2-Salmon | Edmondson | 1240-1265 | 129 |
| Bridwell-Cont. | A1-Salmon | Edmondson | 1120-1168 | 20 |
| Bridwell-Cont. | A2-Salmon | Edmondson | 1145-1300 | 60 |
| Bridwell-Cont. | A3-Salmon | Edmondson | 1302-1307 | 78 |
| Bridwell-Cont. | A4-Salmon | Edmondson | 1269-1276 | 48 |
| Bridwell | 1-Edmondson | Edmondson | 1099-1114 | 50 |
| Bridwell | 2-Edmondson | Edmondson | 1257-1278 | 72 |
| Bridwell | 3-Edmondson | Edmondson | 1094-1105 | 52 |
| Bridwell | 4-Edmondson | Edmondson | 1226-1270 | 50 |
| Bridwell | 5-Edmondson | Edmondson | 1094-1106 | 35 |
| Bridwell | 6-Edmondson | Edmondson | 1222-1276 | 20 |
| Bridwell | 7-Edmondson | Edmondson | 1093-1108 | 50 |
| Bridwell | 8-Edmondson | Edmondson | 2164-1265 | 90 |
| Bridwell | 9-Edmondson | Edmondson | 1086-1104 | 42 |
| Bridwell | 10-Edmondson | Edmondson | 1249-1261 | 92 |
| Bridwell | A4-Salmon | Robertson | 1173-1180 | 55 |
| Bridwell | A5-Salmon | Robertson | 1190-1205 | 125 |
| Bridwell | A6-Salmon | Robertson | 1233-1283 | 20 |
| Bridwell | A7-Salmon | Robertson | 1185-1187 | 31 |
| Bridwell | A9-Salmon | Robertson | 1259-1281 | 15 |
| Continental | C2-Cunningham | Edmondson | 1256-1265 | 121 |
| Texas | 2-Henley | Robertson | 894-1018 | 35 |

### Wichita County

| | | | | |
|---|---|---|---|---|
| Hamer | 1-Hamilton | Durain | T.D. 1903 | Dry |
| Panhandle | 13-Burnett | Meade | T.D. 1537 | Dry |
| Sheldon-Ven. & Mex. | 1-Woodard | TE&L Sec-290 | T.D. 1950 | Dry |

### Wilbarger County

| | | | | |
|---|---|---|---|---|
| Fain-McGaha | DD3-Waggoner | MEP&P Sec-39 | T.D. 2435 | Dry |
| Lewis Prod. | B10-Waggoner | H&TC Sec-8 Blk-4 | T.D. 1840 | Dry |
| Waggoner | M5-Waggoner | H&TC Sec-32 Blk-4 | T.D. 2432 | Dry |
| Barkley-Meadows | C11-Waggoner | H&TC Sec-5 Blk-5 | 1862-1886 | 72 |
| Bradstreet | C4-Waggoner | H&TC Sec-31 Blk-4 | 2398-2400 | 45 |
| Fain-McGaha | L16-Waggoner | H&TC Sec-31 Blk-4 | 2311-2314 | 234 |
| Staley-Wynne | E8-Waggoner | H&TC Sec-25 Blk-4 | 1855-1859 | 115 |

### Young County

| | | | | |
|---|---|---|---|---|
| Richardson et al. | 2-Dean | YCSL Blk-19 | 527-554 | 15 |
| Wolfe | 2-Hill Est. | TE&L Sec-195 | 1019-1026 | 70 |
| Goldsmith-King. | 6-Kunkel | Stell | 1138-1158 | 196 |
| Perkins-Cullum. | 2-Deitrich | Stell | 1136-1149 | 100 |
| Wise-Jackson-Devonian | 1-Miller | Rohus Blk-5 | T.D. 727 | Dry |
| Continental-Underwood | 4-Campbell | TE&L Sec-1376 | T.D. 1051 | Dry |
| Bridwell | 6-Cullers | Hatt | T.D. 721 | Dry |
| Collier | 10-Fee | YCSL Blk-21 | T.D. 597 | Dry |
| Junker | 1-Boley | TE&L Sec-194 | T.D. 1103 | Dry |
| Madden-Junker. | 1-Kunkel | Stell | T.D. 1203 | Dry |
| Petroleum Prod. | 1-Cary | TE&L Sec-410 | T.D. 1135 | Dry |
| Wooten-Reed | 3-Casey | TE&L Sec-1486 | T.D. 651 | Dry |

## PANHANDLE

### Carson County

| | | | | |
|---|---|---|---|---|
| Empire | 3-Deahl | TT Sec-23 Blk-Y-2 | 2305-2314 | 44M |

### Donley County

| | | | | |
|---|---|---|---|---|
| Southland | 1-Lewis | H&GN Sec-3 Blk-29 | T.D. 3005 | Dry |

### Gray County

| | | | | |
|---|---|---|---|---|
| McAuley-Osborne | 2-Morse | H&GN Sec-2 Blk-26 | 2513-2531 | 225 |
| Danciger | 1-McLarty | ACH&B Sec-10 Blk-1 | T.D. 3375 P.B. 3370 | 16M |
| Humble | 1-Palmer | H&GN Sec-31 Blk-B-2 | 3100-3135 | 45 |
| Magnolia | 4-Fee No. 227 | I&GN Sec-11 Blk-3 | 2970-2982 | 150 |
| Texas | 5-Combs et al. | I&GN Sec-36 Blk-3 | 2840-2876 | 4853 |
| Texas | 3-Combs et al. | I&GN Sec-36 Blk-3 | 2770-2820 | 2085 |
| Phillips | 6-Palmer | H&GN Sec-31 Blk-B-2 | 2865-2870 | 4725 |

### Hutchinson County

| | | | | |
|---|---|---|---|---|
| Texas | 3-Moore et al. | I&GN Sec-125 Blk-4 | 3090-3100 | 110 |
| Devore et al. | 1-Johnson | A&B Sec-28 Blk-Y | 2930-2950 | 10 |

### Wheeler County

| | | | | |
|---|---|---|---|---|
| Upham | 7-Gootch | H&GN Sec-81 Blk-23 | 1442-1595 | 34M |
| Wishkamper et al. | 1-Curry | H&GN Sec-53 Blk-23 | 1805-1860 | 10M |
| Lone Star | 1-Stauffer | H&GN Sec-102 Blk-23 | 1535-1620 | 70M |
| Magnolia | 2-Laycock | H&GN Sec-10 Blk-27 | 1825-1860 | 59M |

## WEST TEXAS

### Crane County

| | | | | |
|---|---|---|---|---|
| Texas | 3-Gafford | Univ. Sec-46 Blk-30 | 2825-3000 | 237 |
| Humble | 3-Univ. | Univ. Sec-34 Blk-30 | 3030-3090 | 56 (13 Hrs.) |
| Church-Weekly | 4-Duoll Univ. | Univ. Sec-39 Blk-30 | 2863-2998 | 1563 |

### Howard County

| | | | | |
|---|---|---|---|---|
| Green | 3-Clay | W&NW Sec-127 Blk-29 | 2960-2985 | 195 |
| Gulf Prod. | 9-Clay | W&NW Sec-155 Blk-29 | 1835-1855 | 72 |

### Loving County

| | | | | |
|---|---|---|---|---|
| Lockhart | 3-Allen | H&TC Sec-82 Blk-33 | 4200-4240 | 10g |

### Pecos County

| | | | | |
|---|---|---|---|---|
| Mid-Kansas-Transc. | 32-Yates | ..... Sec-34½ | 1435-1515 | 2030 (1 Hr.) |
| McMan | 10-Smith | GC&SF Sec-25 Blk-194 | 1595-1615 | 250 |
| Cardinal | 2-Tarbery | Arnold et al. Sec-539 | 1280-1285 | 3 |
| Shell | C1-Univ. | Univ. Sec-31 Blk-16 | 1616-1648 | 375 |
| Landreth Prod. | G3-Univ. | Univ. Sec-31 Blk-16 | 1657-1670 | 92½ (15 Hrs.) |
| Landreth Prod. | C3-Univ. | Univ. Sec-31 Blk-16 | 937-994 | 25 |
| Phillips | 3-Courtney | TM Sec-78 Blk-OW | 1380-1397 | 77 (10 Hrs.) |
| Texas-Phillips | 1-Campbell | H&GN Sec-46 Blk-10 | T.D. 2500 P.B. 1775 | 65 |
| Roxana-Kerby | 1-Univ. | Univ. Sec-23 Blk-26 | T.D. 5204 | Dry |
| Indep. et al. | 1-McDonald | H&GN Sec-46 Blk-12 | T.D. 1644 | Dry |
| Schumaker | 1-Williams | GC&SF Sec-1 Blk-117 | T.D. 2504 | Dry |
| Rector et al. | 1-State | H&GN Sec-106 Blk-8 | T.D. 2000 | Dry |

### Ward County

| | | | | |
|---|---|---|---|---|
| Atlantic-Delmar | 5-Hazlett | H&TC Sec-17 Blk-5 | 2465-2503 | 85 |

### Winkler County

| | | | | |
|---|---|---|---|---|
| Humble | 1-Hendricks | PSL Sec-41 Blk-26 | 2812-2900 | 495 |

# Principles of Oil Field Development

*Article III*

## Theoretical Aspects of Oil Well Spacing

By Lester C. Uren

Professor of Petroleum Engineering, University of California

THE previous article of this series was devoted to a review of the factors governing the economic spacing of wells in oil-field development. It was there shown that many different variables enter into the problem of determining the most profitable interval between wells, some physical in nature, others economic.

The magnitude of the natural expulsive energy associated with the oil, the resistance to expulsion offered by the reservoir rock, the properties of the oil influencing its movement and retention, the character of the geologic structure, the diameter of the well and the method of well operation and control are among the physical factors that were found to have an influence on well spacing.

Among the economic factors, it was shown that the cost of development and well operation, the selling price of oil and gas and the interest-earning capacity of invested capital must be given consideration in any complete solution of the oil-well spacing problem.

After this preliminary review of the factors underlying well spacing, we are now in a position to study the relationship existing between them and to consider the results of efforts that have been made recently to formulate these relationships.

We may approach the problem of developing a well-spacing formula in either of three ways. (1) by mathematical analysis after evaluation of the physical variables involved; (2) by experimental research directed toward the physical measurement of the pressure gradient in oil sands and the radius of drainage of wells; and (3) by analysis of actual production data and field records.

All three of these methods of approach have been used and each has possibilities of successful application. The present article will review recent progress along the lines of mathematical and physical analysis. A succeeding article will discuss the results of various field and experimental studies of the well-spacing problem.

### Physical Conception of the Drainage Radius of a Well

Among the different factors that must be evaluated on some basis before a practical solution of the well-spacing problem is possible, is that of the drainage radius of a well, under whatever physical conditions may be presented in the field.

The drainage radius of a well may be defined as that distance over which, at a particular time, it develops its maximum drainage influence; and it will be shown that it is not constant as many have assumed, but is continually varying as the well ages; and that the physical laws which govern differ with the character of drainage: that is, with the nature of the force that causes expulsion of the oil from the reservoir sand.

It will be important before considering the possible formulation of variables entering into the well-spacing problem, to reach a proper understanding of the manner in which the well develops its tributary area and the drainage efficiency achieved in various parts of it.

In discussing the drainage radius of wells, we should realize that the same forces do not always control drainage. In many fields, expanding natural gas contributes the greater part of the expulsive energy, but in others the hydrostatic pressure of edge-water is the dominating force. In every case, gravity plays a definite though often inconspicuous role. The extent to which one or another, or combinations of these forces may be brought to bear under the lithologic and geologic conditions presented in each field, will determine the character of drainage.

It seems probable that where the pressure of edge-water furnishes the expulsive energy, a well may develop drainage over a much greater distance than where expanding gas dissolved in or occluded within the oil is the controlling force and the possible recovery will vary accordingly.

According to Herold[1], where edge-water pressure controls, a properly located well will drain the entire reservoir and there is, properly speaking, no drainage radius. In the case of gas expulsion, we must perhaps, distinguish between the pressure of large bodies of free gas exerting pressure above and behind the oil, and the expansive force of gas originally in solution, but which remains occluded within the oil on partial release of pressure, in the form of small expanding bubbles.

Movement of oil from the reservoir may be expected to follow different laws in each case and for a given set of conditions, the resulting drainage radius will be different in each case.

Probably expanding natural gas within the oil furnishes most of the expulsive energy in the great majority of fields, and it will therefore be particularly important to gain a proper conception of the drainage effects of wells producing under the influence of this force. The writer has previously explained his conception of oil expulsion by this process[2], but a brief restatement of the physical mechanism by which it is accomplished, will be appropriate at this point.

When the pressure of a body of gas-saturated oil filling the pore spaces of a sand, is relieved by the drilling of a well, pressure readjustments begin at the wall of the well and gradually extend outward in all directions from the well as a center, until a certain maximum distance—determined by the

A REVIEW of field data assembled from various sources and laboratory research, bearing on the well-spacing problem, will be given in the fourth article of the current Professor Uren series on oil field development. The article will be published soon in NATIONAL PETROLEUM NEWS.

The first article in this series was published in Oct. 2, page 65, and the second article Nov. 27, page 59.

Another glimpse into the future shows an article by Professor Uren on estimation of the economic life of oil properties and another article on the advantages of unit operation.

[1]Herold, S. C., "Analytical Principles of the Production of Oil, Gas and Water from Wells," Stanford University Press, 1928.

[2]Uren, L. C., "Dissolved Natural Gas in Oil in Ground, a Force that Aids Production," NATIONAL PETROLEUM NEWS, Jan. 26, 1927, pp 71-79.

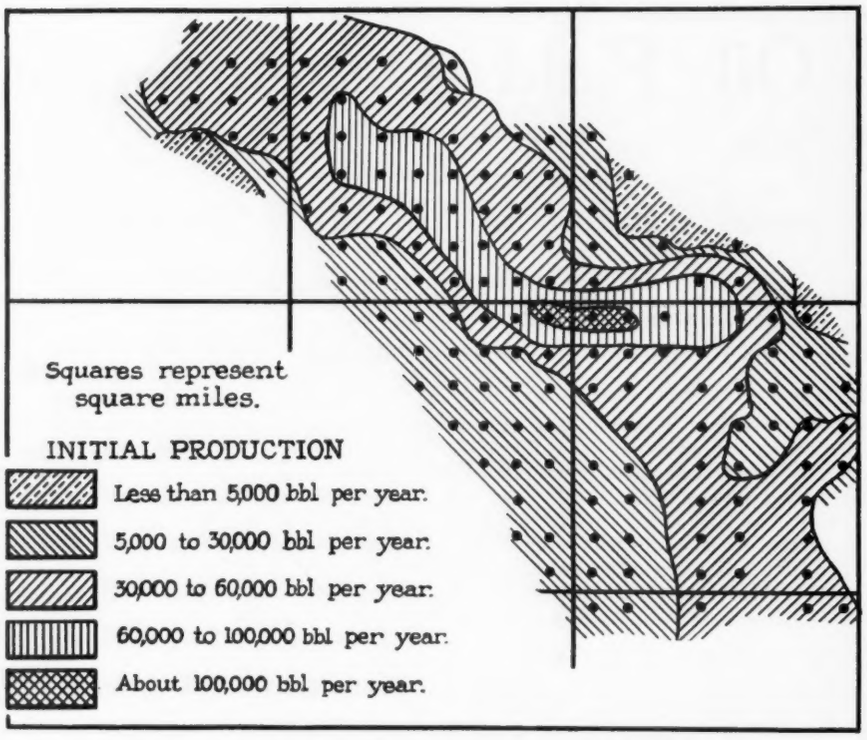

Squares represent
square miles.
INITIAL PRODUCTION
Less than 5,000 bbl per year.
5,000 to 30,000 bbl per year.
30,000 to 60,000 bbl per year.
60,000 to 100,000 bbl per year.
About 100,000 bbl per year.

*Fig. 1—Map of a portion of the Mooringsport pool, Caddo Parish, La., showing variation of initial productions of wells in different areas. Wide variation in permeability and gas content of sands should have led to the adoption of variable rather than uniform spacing, (After Cutler in U. S. Bureau of Mines, Bull. 228)*

pressure conditions and sand resistance —it attained.

As pressure is reduced, gas is released from solution forming minute bubbles which expand gradually as pressure is further diminished. The oil is literally expanded to many times its original volume by this process. The first of these bubbles formed are within the oil sands immediately about the well, this oil being therefore, the first to be expelled.

Reduction of pressure within this zone immediately about the well then causes a reduction of pressure and release of gas from solution within a zone of somewhat larger diameter and further from the walls of the well. This oil follows that which is first expelled, permitting pressure reduction in a still more remote concentric zone.

Thus, the area of influence is gradually extended outward in all directions from the well as a center; but since the sand resistance and gas-bubble resistance increase as the distance to be traversed by the oil increases, a maximum drainage radius is eventually attained at which the sand resistance to oil flow is equivalent to the maximum field pressure. No oil may move toward the well from distances greater than this.

According to Herold[1], this process results in expulsion of all of the drainable oil at the wall of the well, the percentage recovery diminishing in straight-line relationship with distance from the wall of the well until, at the maximum drainage radius, recovery is zero. He reasons from this concept, that a well producing by this means yields ultimately, one-third of the drainable fluid underlying its drainage area.

This ideal conception of the extension and ultimate attainment of a condition of equilibrium of the drainage radius of the well, however, is disturbed by the gravitational settling of the residual oil in the reservoir sand. Residual oil thus concentrated toward the bottom of the oil-bearing stratum, leaves an oil-drained space in the upper part of the bed, through which gas is free to move above the main body of the oil to the well outlet.

Gas moves through a porous rock with much greater freedom than viscous oil: accordingly, there is a tendency for gas to rise to this oil-drained space at points remote from the well outlets and escape to the wells without doing useful work in moving oil. After the influence of declining pressure has extended outward to the maximum drainage radius, and during its progressive advancement outward from the wall of the well, loss of gas from the residual oil in this way accelerates the reduction of local field pressure.

Gravitational readjustments may, in fact, induce drainage of gas from areas beyond the oil-drainage radius of the well, resulting in wide-spread reduction in field pressure. The gas-drainage radius of a well may thus be materially greater than the radius of oil drainage. Development and production records in many fields corroborate this conclusion.

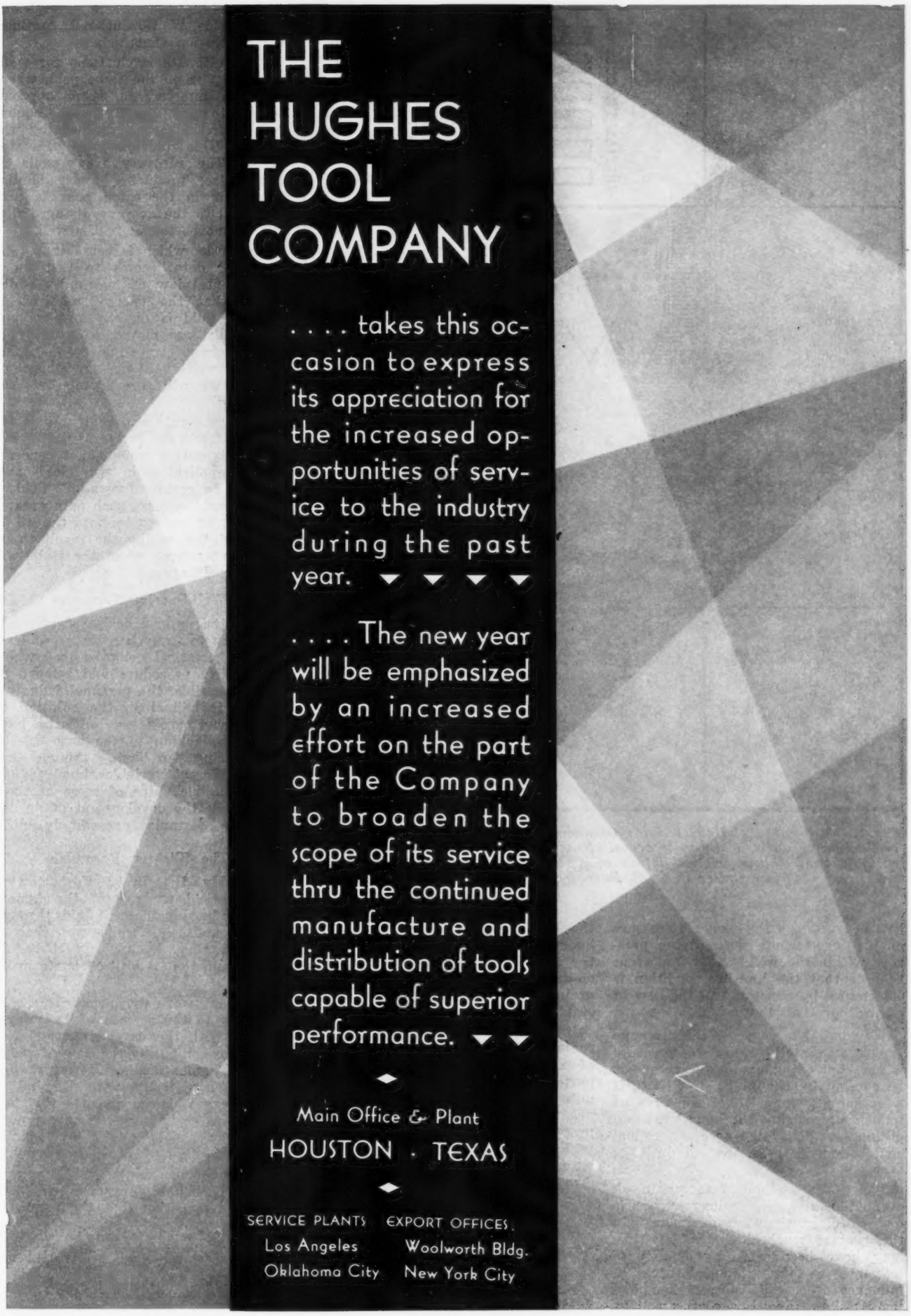
Initial field pressures of new wells drilled during the later period of development are usually markedly lower than during the early development, and initial productions are correspondingly reduced. A few months may in some cases be sufficient for a well to influence acreage several "locations" distant. Wells customarily produce oil with gas-oil ratios ranging from 300 to as much as 10,000 or more cubic feet per barrel—1500 cubic feet per barrel would probably be a low average figure—and yet, this is several times as much as a barrel of oil is capable of retaining in solution at maximum field pressures. Such facts can only be explained by assuming that the earlier wells have caused extensive gas drainage.

We need not necessarily assume that gas drainage may only occur through oil-drained channels formed by gravitational concentration of the residual oil, for it is quite possible, where excessive differential pressures exist between the well and the reservoir sand, that gas may take possession of the more permeable drainage channels, to the practical exclusion of oil from surrounding less permeable portions of the reservoir sand.

Gas moves with much less resistance through the sand than oil, and laboratory experiments have indicated that there is possibly a critical velocity—determined by the magnitude of differential pressure—for a given set of conditions, below which the fluid moved will consist of a mixture of oil and gas, while at higher velocity, the flow will be chiefly gas with comparatively little oil. This is one explanation of the beneficial effect of back-pressure on the well outlet in reducing the gas-oil ratio.

As a result of gas drainage beyond the limits of maximum oil drainage, it is probable that in most cases the field pressure is reduced before the wells develop their maximum potential oil-drainage radius and the actual area of influence in so far as oil movement is concerned, is somewhat smaller than the maximum field pressure would lead us to expect. The well probably only maintains the maximum drainage radius that it achieves for a very short period of time, for as oil production proceeds and the drained space within the oil sand becomes more extensive, gas drainage will be accelerated and the field pressure will rapidly diminish.

Field experience corroborates this conclusion in that during the early life of wells, gas-oil ratios are found to continually increase as production proceeds. This means that the radius of drainage will begin to diminish soon after the maximum drainage radius is attained, the area of influence about the well becoming ever smaller as pressure declines, until eventually an equilibrium condition is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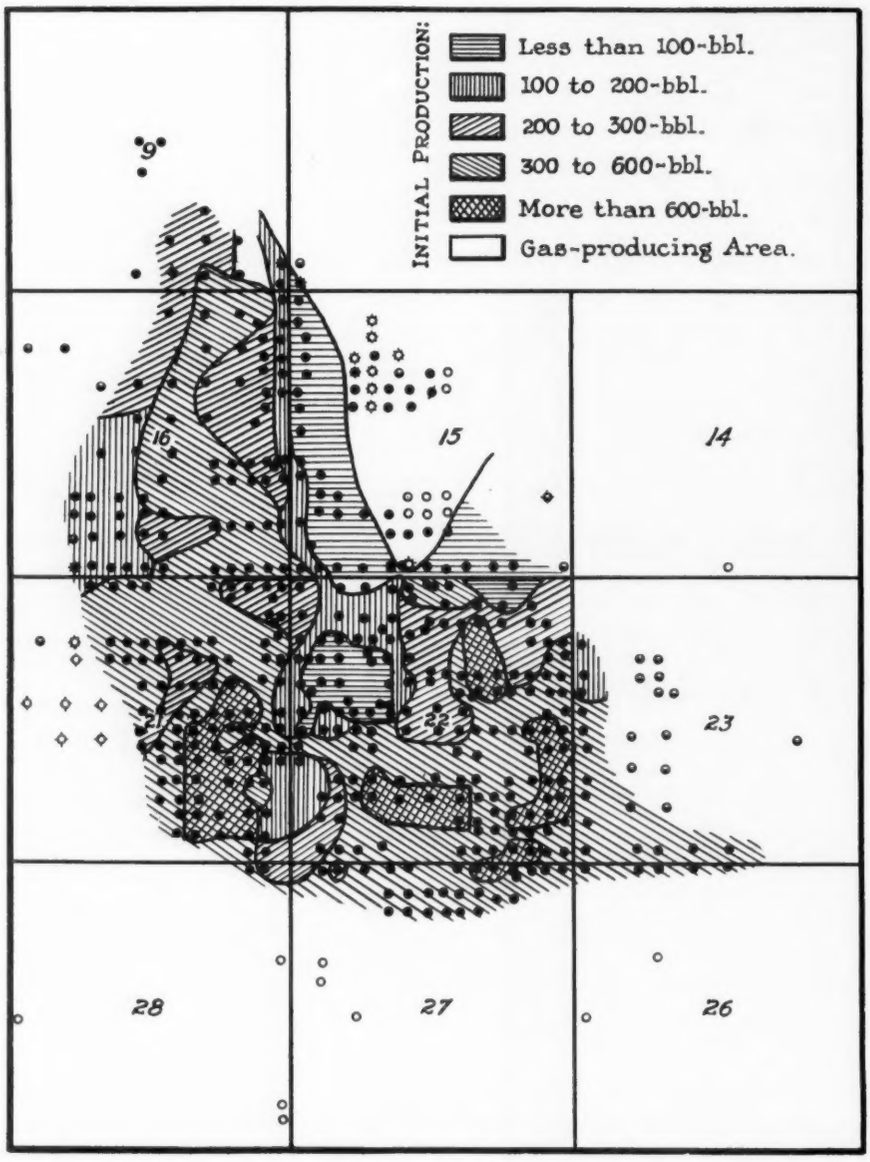


*Fig. 2—Map of the Hewitt field, Oklahoma, showing variation in initial production of wells in different areas. Note irregularity in spacing. Highly variable sand characteristics defeat comparison as between different areas. (After Cutler in U. S. Bureau of Mines, Bull. 228)*

attained between the residual pressure of the formational gas and the pressure within the well. It is important to note that the limiting condition is determined by resistance to the flow of gas rather than that of oil.

We may thus conceive the drainage radius of a well—where gas-pressure is the controlling expulsive factor—to be continually changing: first there is a period of expansion of the area of influence, reaching a maximum oil drainage radius, followed by a gradual contraction of the active oil drainage area.

Time is an essential factor in oil production and gas drainage proceeds more rapidly than oil drainage. In this process, much oil that at one time may have been within the area of influence or the potential area of influence of a well, is overtaken during its slow travel toward the well by the declining field pressure and left behind in the reservoir sand within the zone lying between the maximum oil-drainage radius and the equilibrium drainage radius that eventually brings stability to the entire system.

It is apparent that the drainage radius of a well should not be thought of as a fixed distance, and that a particular radius which we may compute or estimate at one period in the productive life of a well is not a proper one to assume during any later period. The maximum reservoir pressure is not necessarily a measure of drainage efficiency, time elapsing since completion of the well and the extent of gas drainage being also factors that must be taken into consideration.

### Cutler's Theorem

As a result of studies of field production data from wells arranged with various spacings in several different fields, W. W. Cutler, Jr.,[3] reaches the conclusion that:

"The ultimate productions for wells of equal size in the same pool, where there is interference, seem approximately to vary directly as the square roots of the areas drained by the wells." This rule may also be stated thus: "The recovery from wells of equal size, producing under similar conditions in the same pool, is proportional to the average distance that the oil moves to get to the well."

This rule, which is corroborated by the field data, seems to rest on a fundamental law of hydraulics which states that the energy required to move a fluid is directly proportional to the distance moved. According to this theory, if we double the spacing between wells, still utilizing the same energy, we will secure only half the recovery.

While the rule apparently holds for normal intervals between wells, Mr. Cutler expresses some doubt concerning its application in very close spacing—as in certain "town-lot" fields—other considerations, such as a greater tendency of gas to by-pass the oil in the sand, influencing the result to an important degree when the wells are very closely spaced.

### Well-Spacing Formulae

It is the natural desire of all technical men to formulate their problems in mathematical expressions which standardize procedure and remove as far as possible, the personal judgment of the individual in the solution of engineering problems. Efforts have not been lacking in the case of the well-spacing problem, though the many different variables involved and the intangible value of some of them have made the development of an all-inclusive formula exceedingly difficult.

### The Slichter Formulae

Probably the first effort toward mathematical analysis of the factors entering into drainage of fluids through porous sands into wells, was that of Slichter[4] who, in 1898, published a monograph that is still a classic in its field.

Slichter's work was primarily a contribution to the science of hydrology, dealing with the development of formulae for computing the flow of water through porous media. However, they contain a viscosity variable, and if proper expression is given to this factor, there is apparently no reason why they should not apply equally well to the flow of oil through sand.

It should be pointed out however, that the Slichter formulae are based on the supposition that the expulsive

[3]Cutler, W. W., Jr., "Estimation of Underground Oil Reserves by Oil-Well Production Curves," U. S. Bureau of Mines Bulletin 228, 1924.

[4]Slichter, S. C., "Theoretical Investigation of Motion of Ground Waters," U. S. G. S., 19th Annual Report, Part 2 (1897-98).

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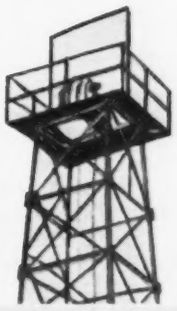

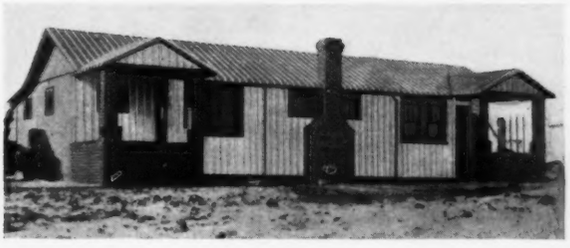

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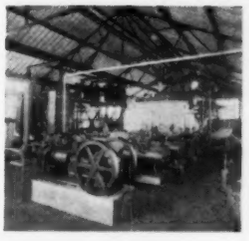

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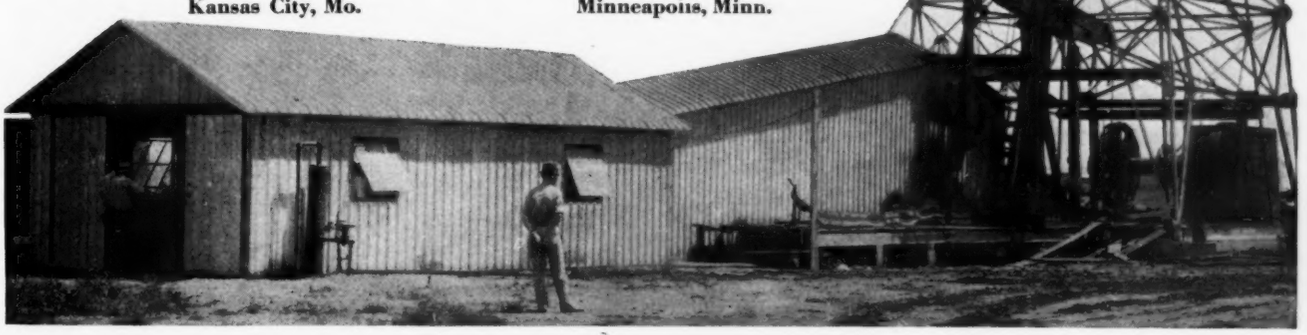

force is developed by gravitation or by pressure from behind and not by an expansive force within the oil as is the case when natural gas is the expulsive agent. They may not be applied therefore, to the solution of the well-spacing problem in the great majority of oil fields, though where gravitational force or pressure of edge-water or large detached bodies of high-pressure gas furnish the expulsive energy, they apparently apply.

It also seems probable that they would be appropriate for use in certain methods of secondary exploitation such as pressure-driving or water-flooding.

Slichter's basic formula expressing the relationship of factors influencing the flow of oil through a cylindrical column of sand, is as follows:

$$(1)\ldots\ldots\ldots\ldots q = 0.383 \times 10^{-6} \times \frac{p \times d^2 \times s \times o^{3.3}}{u \times L}$$

In this formula:

q is the discharge in gallons per minute;

p is the effective pressure, expressed in feet of water;

d is the "effective diameter" of the sand grains in millimeters;

s is the cross-section of the sand column, expressed in square feet;

u is the absolute viscosity of the oil in poises;

o is the porosity of the sand, expressed in per cent; and

L is the length of the sand column in feet.

An expression for the rate of flow of fluid through a sand along radial lines, as toward a well outlet, may be developed from equation (1) above, by integration. R. S. McIntyre has developed the following equation from Slichter's data by this means:[5]

$$(2)\ldots\ldots\ldots\ldots P = \frac{C \times Q \times V}{T \times D^2 \times 0^{3.3}} \times \text{Log}_{10} \frac{L}{R}, \text{ in which:}$$

P is the pressure loss in feet of water;

Q is the quantity of oil produced in barrels per day;

V is the absolute viscosity of the oil in poises;

T is the thickness of the productive sand in feet;

D is the "effective diameter" of the sand grains in millimeters;

O is the percentage porosity;

L is the radius of drainage of the well in feet;

R is the radius of the well through the productive sand, in feet; and

C is a constant.

In so far as the writer is aware, the constant of equation (2) has never been evaluated, so that we lack the means, as yet, of applying it practically in the solution of field problems.

### The Haseman Formula

W. P. Haseman has proposed the use of a spacing formula which permits of estimating recoveries obtainable by various spacing intervals if the production by one interval is known. The formula is as follows:[6]

$$(3)\ldots\ldots\ldots\ldots P_n = P_o\,(1 - e^{-Kn}),$$ in which $P_n$ is the percentage of total oil in a given reservoir, yielded by

n wells to each 10-acre tract;

$P_o$ is the percentage of total oil in the given reservoir that will be produced by an infinite number of wells to each 10-acre tract;

K is the spacing constant; and

e is the base of the Napierian System of Logarithms.

The production secured by a given spacing of wells is in itself, a measure of all of the many physical variables that influence the expulsion of oil from the reservoir rock. Accordingly, if we know or can estimate the ultimate recovery of a group of wells in a field, with a certain spacing, we can, with the aid of this formula, estimate the probable ultimate recovery that might be secured by any other spacing.

We must however, assume a value for $P_o$. With values for $P_n$ and $P_o$, we may compute the value of the spacing constant, K. Having the value of K for the conditions presented, we may then compute new values for $P_n$ for any other assumed spacing of wells.

This formula is useful in analyzing the results of different spacing programmes, and agrees closely with actual field data, as demonstrated by Dr. Haseman.[7] It will be recognized however, that it is open to the objection that it rests on an assumed value of $P_o$, which may vary within wide limits under different field conditions. $P_o$ is the maximum amount of drainable oil in the reservoir, being the total amount less that which is held in the reservoir rock after drainage is complete. Neither of these quantities may be known with any degree of accuracy, particularly during the early period of recovery when the spacing interval must be determined.

In his published demonstrations of application of his formula, Dr. Haseman arbitrarily assumes $P_o$ to be 50 per cent of the total oil content, which is probably a high value for most cases. The Haseman formula, furthermore, cannot be applied in advance of exploitation of the field without making other estimates and assumptions which make the result largely an expression of the judgment and experience of the user.

Without the results of a period of production of sufficient duration to estimate ultimate recovery for a particular spacing, both $P_n$ and K, as well as $P_o$ must be estimated, and so many physical variables enter into these factors that estimates of their combined influence would seem to be but little more than a guess.

Granting that the Haseman formula is applicable only in cases where previous production data in the field are available, it would appear to be of use chiefly in post-mortem studies of what might have resulted had a different spacing programme been adopted. What is needed however, is a formula that will permit of predicting proper spacing in advance of development. Even though we might concede possible use of such a formula on undeveloped tracts on the basis of results of earlier exploitation on adjoining tracts, it is apparent that decrease in the field pressure as a result of earlier exploitation, would have resulted in a change in the value of K.

The writer does not wish to disparage the value of the Haseman formula. Unquestionably, it is of material value in showing where earlier development was at fault and in pointing the way toward more efficient well-spacing practice. It is believed however, that this formula, like the others thus far developed, does not offer a complete solution of the well-spacing problem.

### The Phelps Formulae

In a recent paper read before the Petroleum Division of the American Institute of Mining & Metallurgical Engineers, R. W. Phelps outlines the development of two different sets of formulae designed to assist in the calculation of the drainage radius of wells and the recoveries and profits resulting from different well spacings.

One of these is based on Cutler's theorem, which has been discussed in a previous section; the other is based on Herold's "Capillary Control" conception of drainage by expansion of gas occluded within the oil. After developing the two formulae from entirely different fundamental principles, Phelps then demonstrates, by applying them to a typical problem, that they produce very similar results.

The formulae based on Cutler's theorem is as follows:

$$(4)\ldots\ldots\ldots\ldots \frac{(A+X)^3}{X^2} - \frac{2VK}{C} = 0.$$

$$(5)\ldots\ldots\ldots\ldots R = \frac{VK}{(A+X)^3} - \frac{C}{X}$$

In these formulae:

X is the well spacing in terms of acres per well;

C is the cost of drilling each well;

V is the present value of the avail-

[5]McIntyre, R. S., "A Study of Factors Influencing the Underground Drainage of Oil Sands," thesis for Master's degree, University of California, 1924.

[6]Haseman, W. P., "A Formula Method for Well Spacing and Rate of Production," National Petroleum News, May 8, 1929, pp. 59-65.

[7]Haseman, W. P., "A Theory of Well Spacing," Tulsa meeting, American Inst. of Mining Engineers, Oct., 1929.

able production per acre including pumping costs;

R is the maximum profit per acre; and

A and K are constants.

In applying formulae (4) and (5) it is necessary to have available the production results for two different well spacings in the field being studied, or in a field presenting similar conditions. Having two different sets of values for X and V, we may compute the values of the constants A and K. Knowing these constants, we may then compute the value of V for any other assumed value of X, and knowing the value of V we may, with the aid of formula (5) compute the value of R for any assumed value of X.

A solution based on Herold's "capillary control" theorem is somewhat more complex. Four different formulae are necessary; these are:

$$(6) \quad y = 1 - \frac{0.38\ S}{R},$$

$$(7) \quad S = 61.11 \sqrt[3]{\frac{RC}{V}} \quad \text{(for values of y greater than 0.462.)}$$

$$(8) \quad S = 63.5 \sqrt[3]{\frac{RC}{V}} \quad \text{(for values of y less than 0.462.)}$$

$$(9) \quad R = \left(0.945 - \frac{0.342\ S}{R}\right) - \frac{43{,}560\ C}{S}.$$

In these formulae:

y is the ratio of the ultimate production per acre at S spacing, to the available production per acre;

S is the distance between wells expressed in feet, for maximum profit per acre;

R is the radius of drainage;

C is the cost of drilling each well;

P is the maximum available production per acre;

V is the present value of the available production per acre;

R is the maximum return per acre including pumping costs.

In making computations with these formulae we must also make use of another relationship: $V = F\,P$, in which F is merely a factor used to compute the value of V from a known value of P.

In applying these equations in the solution of a practical problem, it is first necessary to know the ultimate recovery per acre for two different well spacings in the field in which we are interested or in one presenting similar physical conditions.

Having these values available, we may with the aid of equation (6), compute a value for y in terms of R for each of the two spacings. Determining the ratio of the two values of y and substituting the equivalent of one in the equation of the other, we may solve for R, the radius of drainage. Knowing R, we may next compute an absolute value for y for one of the two known spacings, and dividing the corresponding ultimate recovery per acre by the computed value of y, we then determine a value for P. The value of F will be known or can be estimated from available production cost data and suitable discount tables; hence, knowing P we may compute a corresponding value of V.

We next select either formula (7) or (8) according to the value of y, computed as above, and solve for S, the well spacing giving maximum profit per acre. Knowing S and other necessary values as determined above, we may next compute the maximum net return per acre, R, with the aid of equation (9).[5]

A careful reading of Mr. Phelps' contribution leaves the reader impressed with the mathematical ingenuity of his method of approach. One familiar with engineering mathematics will not find the application of his formulae so complex as the foregoing outline might lead him to expect.

Many however, will be unwilling to accept the premises on which they are based. They assume uniform sand conditions throughout the field and a constant drainage radius. The foregoing discussion has shown that the drainage radius of a well is continually changing as the field pressure diminishes; hence, a radius computed for one set of conditions can not be assumed to hold even a few months later when the field pressure has declined.

That stratigraphic and lithologic conditions are too variable to assume that the production results in one part of a field can be depended upon in computing spacing for another part of the field, is well illustrated by Figures 1 and 2.

Mr. Phelps' formulae are also open to the same objection that was raised in the discussion of Dr. Haseman's formula: they require the results of a period of production extending over a sufficient length of time to estimate ultimate recovery by a group of wells under a definite spacing. In fact, the Phelps formulae require two such sets of data, which in most cases would not be available until development of the field were well advanced. In these days of rapid competitive exploitation, most producers are necessarily committed to a certain programme of development soon after development is under way. They cannot afford to wait while their competitors experiment with one or two different spacings before beginning their own development programme and then too, opposing operators' production data are not usually available.

When the well-spacing problem is solved, it will be by a method which permits of estimating the proper interval between wells early in the development of the field. It must furthermore, be a method that will give expression to differences in permeability of the reservoir sand in different localities and to the effects of declining field pressure as development of the field progresses. Like the Haseman formula however, Mr. Phelps' formulae will be useful in studying the results of various methods of spacing. Even though the results are learned too late to permit of application in the areas in which the data are gathered, they yet may serve as an approximate guide in the subsequent development of other areas. Knowledge of the mistakes made in earlier field practice, which may be disclosed by studies conducted with the aid of the Phelps formulae, will assist in standardizing later practices on a more economic basis.

### Difficulties in the Way of Mathematical Development of Well-Spacing Formulae

The reader who has carefully considered the effects of the many different factors entering into the development of well-spacing formulae and who realizes the intangible character of certain of them, will appreciate the almost insurmountable difficulties in the way of formulating a complete mathematical expression having practical application to field conditions.

In the opinion of many who have carefully considered the matter, efforts based on the mathematical method of approach are futile. The formulae that have been presented above are in each case dependent upon field data which, in themselves, are quite variable and highly sensitive to slight changes in methods of well operation and control.

Wherever the assumption is made that a certain set of sand conditions that have controlled the drainage radius and production efficiency of one group of wells, apply also to another group, even though they be situated near-by and in the same field, the assumption is open to serious question.

Results that have been attained with a certain initial field pressure and drainage radius in one group of wells, do not provide a reliable basis for computing proper well spacings when the drainage radius becomes

[5]For a detailed explanation of procedure and a typical solution of an illustrative problem, the reader is referred to the original paper by Mr. R. W. Phelps, entitled "Analytical Principles of Spacing Oil and Gas Wells," and printed in "Petroleum Development and Technology, 1928-29," the annual year-book of the Petroleum Division, A. I. M. & M. E., pp. 90-103.

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Economics of pipe line pumping Feb. 6, p. 54

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Pumping problems facing Winkler operators Sept. 12, p. 42

Special well hook-ups designed for Winkler Sept. 12, p. 44

Portable emergency pumps for pipe line service Sept. 12, p. 54

Multiple pumping of oil wells Aug. 22, p. 51; Aug. 1, p. 47

How power pumping cuts costs on Kansas lease July 11, p. 99

Selection of power equipment for oil well pumping June 27, p. 81; June 6, p. 91; May 23, p. 49; Apr. 25, p. 69; Apr. 18, p. 24

Co-operative pumping of deep wells in Cromwell June 12, p. 60

Fluid displacement pump used with gas lift Apr. 25, p. 100

Application of power on oil well plunger pumps March 21, p. 63; March 7, p. 67

Review of developments in plunger pumping equipment Jan. 4, p. 55; Dec. 7, 1927, p. 93; Nov. 30, 1927, p. 53; Nov. 9, 1927, p. 65; Oct. 26, 1927, p. 67.

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***Cleveland, Ohio***

smaller as a result of reduction in field pressure, even though the sand conditions are identical.

Neither are we justified in assuming that producing conditions remain constant throughout the productive life of an oil property: they never do; and it is still more improbable that two different properties under different management will be similarly handled.

Slight differences in the back-pressures maintained on the wells during the early period of production, and in the positions of fluid levels in wells during the later pumping period; differences in the diameter of the well or the well cavity within the oil sand; differences in frequency of cleaning wells; differences in manner of well operation (as natural flow, gas lift, mechanical pumping, vacuum pumping, and the time interval over which each extends): all have their influence on ultimate production.

One cannot foresee how the production of a given property will be influenced by such production variables, nor should he assume that the cycle of operations adopted on one property will be identical with that on another during a later period.

The effective drainage radius of a well is not constant, but as has been explained above, is continually varying, and the rate of variation during different intervals of time, is governed in turn by other variables of complex character. Generally we will find it unprofitable to space wells apart by a distance equivalent to twice the maximum drainage radius, for when the radius of influence diminishes with reduction in field pressure, we will then leave much of the oil without the area of influence.

If it is economic to do so, wells should be spaced at something less than half the maximum drainage radius, in order that a larger proportion of the available oil may remain within the range of influence of the wells long enough to effect its recovery. While the tendency is toward increased recovery by placing wells within drainage radius of each other closer together, they develop increasing interference effects by so doing, and recovery efficiency is eventually influenced adversely by greater "by-passing" of gas, which is also characteristic of close spacing.

### *Conclusion*

IT MUST be admitted, in view of the foregoing discussion, that the well-spacing problem is, to say the least, complex: that in reality the economic spacing of wells presents a group of related problems, some of which with data at present available, or that can be readily assembled in ordinary field practice, are not susceptible of accurate analysis. This being true, we can at present only approach a general solution by a series of approximations.

Rather than place dependence on difficultly understandable mathematical formulae, most oil producers will prefer to approach the problem through analysis of field data. Physical data secured under carefully controlled conditions in laboratory apparatus will also lend corroborative evidence of convincing character.

In adopting this viewpoint however, we must not definitely discard the hope of eventually formulating the many factors along mathematical lines. Though not apparently feasible today, it should eventually be possible to do so.

The next article of this series, concluding the discussion of well spacing in oil-field development, will review recently assembled field data bearing on the well-spacing problem and will discuss the possible contributions that might be expected from a well coordinated program of experimental research.

## Patent Rolling Rig Method For Coating Pipe

NEW YORK, Dec. 30.—The Wailes Dove-Hermiston Corp. announces it has been granted a patent covering the use of what is generally known as the "rolling rig" or "turning rig" method of applying protective coatings to pipe lines. The patent is said to be a basic one, covering the various steps in the process, which can be used on pipe of 16 inches diameter and larger.

In this method, lengths of pipe are revolved on a rack while the molten coating is spread over the surface by means of a canvas pad. The rolling rigs were built and introduced for pipe line work by the Wailes Dove-Hermiston Corp. They have been used on some of the extensive pipe line projects carried on in the southwest the past year.

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**Beecher Investigates Explosion**

NEW YORK, Dec. 27.—S. E. Beecher, of the Empire Companies, Bartlesville, Okla., has been appointed to represent the American Petroleum Institute on a commission of engineers to investigate the explosion at the U. S. Bureau of Mines station at Bartlesville Dec. 13, which caused the death of R. R. Brandenthaler and Meredith Miles Jr. Other members of the committee will represent the American Institute of Mining and Metallurgical Engineers, American Gas Association, Bureau of Mines, and the state of Oklahoma.

# Modern Refining—Science and Practice

By Colonel George A. Burrell*

Article 4

## Modern Fractionating Columns; Comparison of Packed and Bubble Columns; Character of Feed

THE still is a medium for heating the oil prior to rectification. They may be batch shell stills, continuous shell stills, tube stills or stills in the bottom of a column itelf. In the latter is a coil of pipe, or tube bundle, heated by steam or hot oil, for furnishing heat additional to that supplied in the primary distillation. For the column to rectify an oil, there must be enough heat furnished to vaporize the desired overhead fraction and an intermediate one out of which the top cut is rectified.

### Consecutive Versus Collective Distillation

Distillation of oil by consecutive distillation, i. e., by removal of one fraction after another, of necessity demands higher temperatures than when the mixture is collectively distilled, i. e., the whole mass heated to a certain temperature and the desired fraction flashed off. In the latter method the "steam stilling" or partial pressure effect of the lighter fractions reduces the temperature necessary to distill the heavier fractions. Cracking is diminished. In batch still practice one has consecutive distillation and in tube still practice one finds collective distillation.

### The Column

The columns used in the past and present, in the refining industry, represent a period of development, from no column at all; just a pipe sharply bent downward from a small dome on the still; next inclined or vertical empty pipes, and next columns filled with various materials; bricks, crockery, pipe fittings, steel turnings, or special fillings[1], sieve plates, sieve plates with downcomers, and finally the present bubble plates with caps. Other industries employing fractionating equipment passed through the same development.

Columns can be condensed into four main divisions:

(1) Packed columns.

(2) Plate columns.

(3) Perforated plate columns (sieve columns).

(4) Bubble plate columns.

### Packed Columns

The trouble with these columns is that intimate contact between descending liquid and ascending vapor is not accomplished (channeling occurs) except in those of small diameter and filled with small uniform fillings, of the order of small Raschig rings or similar fillings; Bregeat, Lessing, etc. But for the large columns of the size used in the refining industry packed ones lack efficiency for the reason given. The one virtue of packed columns is that they are cheap and easy to erect. They have high capacities where sharp separation is not demanded. The smaller the packing the sharper the separation obtained.

Another objection to packed columns is that the lower part readily fills itself with condensate-fluids. However, packed columns, filled with a uniform filling, say Raschig rings, are sufficient for small columns. Channeling of moment does not occur in these small columns. Of course, a packed column or any other kind of a column, if made tall enough, will work as efficiently as a shorter bubble column say, but the column height becomes prohibitive.

The whole question is simply one of intimacy of contact between vapor and liquid in the column; hence, if sufficient travel for the vapors and liquid is provided, this intimacy of contact finally occurs.

The question of the use of a packed column against a bubble type column is one of cost. The latter, in the sizes needed for petroleum work, will make the desired separation at a lower cost (first cost plus operating costs) than a packed column. Packed towers in large sizes are still used in acid plants because those of bubble tower construction are attacked by the acids.

The best column that was ever built probably was Midgely's carborundum coated laboratory column. Normal hexane can be obtained to a boiling point of 0.3 of one degree in three fractionations from ordinary

[1]Like Raschig and Bregeat rings.

*Consulting Chemical Engineer, Pittsburgh, Pa.

BECAUSE of requests from readers to secure as quickly as possible the entire series of articles on practical refining methods which Col. G. A. Burrell, consulting engineer, is writing exclusively for NATIONAL PETROLEUM NEWS, arrangements have been made to publish these articles every week, instead of every other week as originally scheduled.

In some cases material that was originally prepared for two articles will be carried in one article.

Readers of this series will benefit in that not only will all the material as originally outlined be brought to their attention more promptly; but also by the fact that Col. Burrell is continually revising his articles to bring into his discussion the latest developments in research and practical refining which are taking place.

Even though these articles were written only a few months ago new developments have contributed to the knowledge of the industry on certain phases of refining, and readers of this series, through the care of the author, are being given these new developments.

gasoline and certain hydrocarbons have been obtained in greater purity than ever before accomplished. It would probably be called a special packed column, very efficient in small size, but not adapted for large columns.

**Plate Columns**

By these are meant columns in which the plates extent part way across the column, alternate plates extending from alternate sides of the column. The best ones may approach poor packed columns in efficiency of separation, depending upon the type of each column. But they are open to the same objection as packed columns. Intimate contact between rising vapor and descending liquid is not obtained. On the other hand, they have high capacities, a low pressure drop and do not become plugged. Plate columns are cheaper to install than other types.

**Perforated Plate Columns**

By these are meant sieve columns, i. e., plates punched full of holes and built into the column all the way up. These columns came after the present bubble cap and plate columns. Liquid at the desired depth is maintained on the plates and prevented from emptying to the plate below by the velocity of the upcoming vapors. The latter are thus made to bubble through the liquid on the plates, hence their action is the same as the plates in bubble towers.

Holes in the plates must be small enough to keep a certain amount of liquid on each plate. But if the still is worked too fast the plates fill up; if too slow they are emptied of liquid. Equipping the plates with downcomers (chimneys) remedied the first defect but not the second. Another disadvantage of sieve plates is that the edges of the holes rust easily and sometimes fill up.

These sieve[2] or perforated plate columns approach the efficiency of bubble plate columns when the still is worked at constant capacity. But, as stated, variations in feed supply to the column are fatal to good separation. However, they are quite extensively used. In some of the older alcohol plants they may be found in sizes up to 8 feet in diameter and apparently are giving good service.

[2]A sieve plate tower has been patented by Wm. Holland of the Standard Oil Co. of Indiana, and for a time used by that company, in which nipples extended downward from the holes to provide still more contact between the vapors and liquids.

IN ARTICLE 5 of Col. G. A. Burrell's series on refining practice appearing next week in the NATIONAL PETROLEUM NEWS the author discusses temperature control and its importance in the efficient rectification of petroleum products. Not only is it necessary to control accurately and uniformly the overhead and bottom temperatures of the column but it is important that the operator know something about the relationship between these temperatures and the type of products he wishes to manufacture.

Taking off side streams from a fractionating tower complicates the situation for the operator, and reduces correspondingly the degree of separation attained. Distances between plates vary from 10 to 24 inches, according to the ideas of the designer and the conditions to be met. The reasons why side streams interfere with good fractionation of products are given at length by the author, who sums up the conclusions drawn from practical experience thus: "It matters not what expedients are employed, this general rule applies, *in the normal column only one well fractionated cut can be made.*"

Col. Burrell discusses exhaustively the various practicable means employed by different refiners in order to obtain one or more side streams from the tower without upsetting the equilibrium of the tower. Reflux, reboilers, and other methods that have been used serve to improve the results obtained but are at best only partially corrective. Typical installations are presented and the results obtained should be of interest and practical value to every refiner concerned with improving his distillation-rectification equipment or its operation.

This article will appear in next week's issue.

All of the foregoing types of columns are still in use in the refining industry. Their use may be justified where sharp separations are not desired, where high capacities are wanted at minimum cost, and where much trouble is experienced from the towers choking up. Some one of the three types discussed may meet one or more of these conditions at minimum cost of erection.

**Bubble Cap and Plate Column**

We now come to a study of those columns considered the most efficient in all those arts; alcohol, liquid air, coal distillation, petroleum, etc., in which they have been used. I have reference to the so-called bubble cap and plate columns[3] and equipped with plates, bubble caps, chimneys for rising vapors and separate chimneys (downcomers) for delivering condensed liquids to the deck below.

Decks in bubble columns made by the Power Specialty Co. of New York, have long aperatures arranged parallel to each other across the deck. Over these are correspondingly long serrated caps which dip into the liquid seal. Each deck has two downcomers or down-discharge pipes which deliver condensate to opposite sides of the deck below.

[3]Frequently called bubble columns or bubble towers.

Decks of columns built by E. B. Badger & Sons Co. of Boston, have a large number of small apertures over which are fitted hemispherical caps. A baffle crosses through this deck so that the liquid has to travel through a longer narrower path than if it entered on one side of the plate and discharged on the other. The liquid flows substantially countercurrent to the vapors.

Decks of some columns built by the Burrell-Mase Engineering Co. of Pittsburgh are arranged so that there is provided 5 series contacts of vapor and liquid on each deck, instead of one as is the case with the ordinary tower.

Robinson has traced the development of the bubble column as follows:

"The first approach to the modern cap and plate column (bubble) tower was a column with perforated plates extending clear across the shell. Several or many of these plates were used. Vapor from the still passed up through these plates, with some condensation occuring thereon. Vapor continually ascending forced its way through the liquid as the latter tended to fall through the holes.

Considerable contact occurred between vapor and liquid but the depth of the liquid was shallow. Further, the column always had to work at high capacity to keep the liquid from falling through the holes. Also the holes were easily corroded. A little corrosion meant a pronounced increase in area of the holes and great loss of column effectiveness.

"Next the plain holes were replaced with short nipples, their upper halves bent at right angles so that the vapor more or less swept the surface of the liquid. Finally there appeared a simple cap type, the forerunner of the cap type of today. In this first cap type one large central nipple was employed covered by a cap or bell whose edges dipped beneath the liquid, the vapor escaping beneath the cap and up through the liquid.

Next, the bubbles were reduced in size and distorted to expose a large surface. This was accomplished by means of various expedients, such as serrating the edges of the cap, or boring a large number of holes in

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that part of it beneath the surface of the liquid.

Finally, instead of one large central cap, a large number of small caps were employed so that, instead of ascending through only one opening to the plate above, the vapor ascended through many openings. Thus there was accomplished a fine division of the vapor in streams and bubbles, providing intimate contact between condensed liquid and vapor at many points.

**Comparison of Packed and Bubble Columns**

As already stated a bubble column furnishes intimate and uniform contact between rising vapor and descending liquid better than any other type of column. Heckmann's invention of the bubble cap in 1886 persists as the most important contribution to column construction ever made. All sorts of caps and plates and combinations have been since developed. But Heckmann was the pioneer.

Since plate and packed columns suffer because they do not provide intimacy of contact and allow channeling to occur in considerable degree, and since this inevitably occurs in greater degree as the diameter of the column increases, and diminishes for a given diameter as the column height increases, one can build a packed column of sufficient height or of small enough diameter to decrease channeling to a point where the bubble column has no advantage to offer. But in that case column heights become prohibitive or so small in diameter to be of little utility in most refining operations. In some work small packed fractionating columns can be used to advantage, for it is probable that up to a diameter of 18 inches[4] the bubble column has little to offer over a column provided with small uniform 1-inch cylindrical packing. In some of the writer's work it offers enough decreased pressure drop to be of moment.

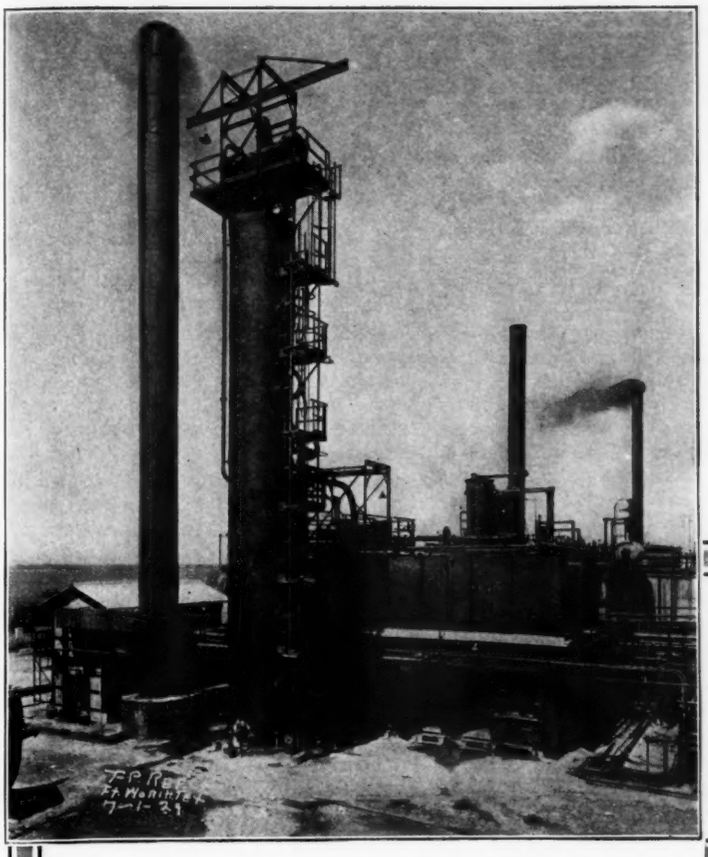
There is not much data available that gives a rigorous quantitative comparison between bubble and packed towers. H. G. Smith[5] found that as between a packed and bubble tower of modern design, an 8-plate tower was equal to a packed tower about 50 feet high filled with 3-inch corrugated, cross partitioned, acid tower packing, placed at random in the tower and provided with an effective reflux distributor at the top.

Peters[6] found that for hollow cylindrical rings of length equal to diameter that one-inch rings require 40 inches of tower height to furnish the equivalent to one theoretical plate, and that the height required for other sizes is substantially proportional to the size, i. e., ½-inch rings would require 20 inches of tower height, etc.

**Theoretical Plates**

In column design for binary mixtures using the Sorrell-Lewis-Thiel-

[4]Considering cost and utility.
[5]Am. Inst. Pet. Engrs., Feb., 1927.
[6]Ind. Eng. Chem., 14, 476, 1922.



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McCabe mathematical method, one proceeds on the assumption that a plate possesses perfect efficiency and then makes allowance for the efficiency drop of commercial plates. It is probable that these plates never exceed an efficiency of 80[7] per cent and they may drop as low as 30 per cent if the plates are uneven, so that some caps do not come into use, due to short circuiting, and if the bubbles produced are not broken up enough, or if the column is pushed too hard.

**Character of Feed Introduced Into the Column**

Either liquid or vapor may be introduced as feed into a column. Both methods are practical. A liquid feed means that a large amount of reflux is thrown onto the plates below the point of entrance of the feed. A vapor feed overloads the column when the overhead fraction is a small percentage of the total. If the overhead fraction is small and the feed enters as liquid the main task of the column centers on the lower plates and sufficient sections must be provided to strip the residue of the volatile component. If the overhead fraction is large the upper part of the column must be of ample capacity to strip the volatile component of residue.

**Lagging the Column**

Columns operated at high temperatures, like petroleum columns, should be lagged. The only source of entering heat should be the still and theoretically there should be no gain of heat from any other source or loss to the surrounding air by radiation. The latter is impossible, of course, hence columns are lagged to stop as much radiation as possible.

Particularly in the upper part of the column should the spacing of the baffles and the insulation of the columns be such that the temperature differences between the baffle sections be small and uniform. This is where the vapor is rich in the volatile component, and difficulty is experienced in throwing back the last portions of base product. Hence the more vapor that can be condensed and the more repeated the condensation and distillations that take place, the more effective the final separation.

A column will, of course, work lagged or unlagged, but in the latter case more heat will be required to make a given separation, and some efficiency is sacrificed. An unlagged column is subject to changes in weather temperatures.

**Reflux in Continuous and Batch Columns**

In continuous operation of columns, the feed, overhead and reflux can be kept constant during a run, but in batch operation the amount of reflux must be continually changed because the overhead product becomes poorer in the more volatile component, say the gasoline, all the time. But by changing the reflux fairly satisfactory operation can be obtained except at the end when too much kerosene makes its appearance.

**Reflux at the Top of the Column**

The term "reflux ratio" is often used. This means the amount of distillate refluxed back to the column, compared to the pounds of net product formed. This reflux ratio is dependent upon the temperature carried at the top of column, the temperature at the bottom of the column and the sharpness of separation desired, height of tower, and number of plates. Assuming other conditions are satisfactory in or about the column, a certain temperature has to be maintained at the top of the column to produce a certain cut overhead.

One can operate a column with the theoretical minimum amount of reflux, in which event an infinite number of plates will be needed, or one can use an infinitely large amount of reflux and a minimum number of plates. In the first case the cost of the column will be exorbitant but the amount of heat needed will be relatively small. In the second case the column cost will be low, the net product small, the heat requirements high, and a column of larger diameter is needed to take care of the increased reflux.

**Place to Introduce Reflux**

The place to put refluxed gasoline or other overhead volatile component back into the column is on a plate where the composition of the liquid on that plate is of practically the same composition as the entering reflux. This is on the top plate. If on a lower plate equilibrium, or rather the approach to equilibrium conditions on that plate, is disturbed, and the action of the plate more or less impaired. All the way up the column conditions are changing from plate to plate. Each of the latter have a definite function to perform. Introducing a foreign substance (a liquid of different composition) upsets the conditions prevailing on the plate.

**Variation in Reflux**

One finds widely differing practices in refining operations covering the amount of reflux returned to the top of a column. This is in part because of the fact that plates and reflux are interchangeable. One column may work with a limited number of plates and a lot of reflux, and another one doing essentially the same work operates under reverse conditions. Thus the required gaps are obtained and everybody is happy. Gaps have developed, to a considerable degree, into the criteria of column efficiency. Yet one refiner's operating expense may be twice as high, as another's, for the same gaps. The more reflux that is returned the greater the amount of heat that must be put into the column. On the other hand, if the plates are too many, and fuel consumption low, the column may be of too high initial cost.

[7]However W. K. Lewis found a plate efficiency of 95 per cent in a 10 plate column, 13½ feet high.

Gaps are useful, of course, in showing relative separations. From an absolute standpoint they mean little, for Engler or Hempel boiling points are widely different from the true ones.

Columns have been installed to replace inferior ones, or no columns at all, and the over-lapping and re-running has been so greatly reduced that a satisfying, although not necessarily the best result, by any means, has been secured. Too sharp a separation, that is too much gaping, may not be justified by the results obtained, for the sharper the separation, for a given column, the greater the fuel consumption, and the additional small increment of gasoline obtained say, may be obtained at too high a cost.

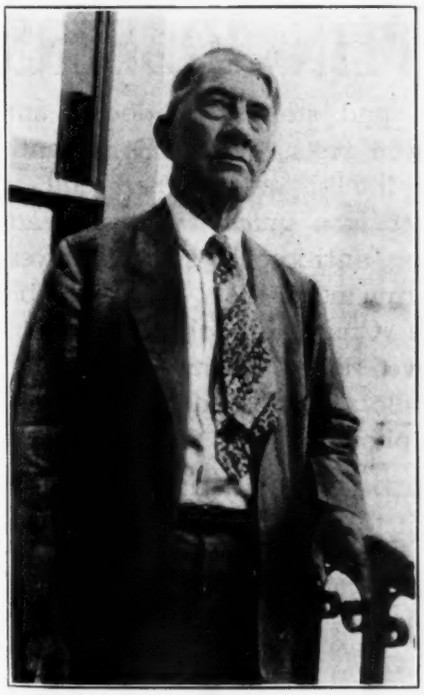
## Pioneer Oil Refiner Is Widely Known

HOUSTON, Dec. 27.—Ask anybody in the southwest who was the pioneer of the Independent refining industry in that territory and he will promptly reply:—"A. B. Slimp."

Mr. Slimp, who heads the Pioneer Oil & Refining Co., San Antonio, entered the business soon after Spindletop paved the way for history-making developments in all branches of the industry.

He started with a five-gallon kerosene can, when burning oil was the industry's principal product, and built a business that now includes a modern 2000-barrel refinery in the Somerset field, south of San Antonio.

Pioneer Oil & Refining Co., as now constituted, dates from 1920, when it was organized with Mr. Slimp as president; H. C. King, Jr., vice president; M. L. Roark, secretary; A. W. Nunn, assistant to the president; and H. B. Slimp, superintendent.



*A. B. Slimp*

In addition to 70 miles of gathering lines operated for the transportation of crude oil to the Somerset plant, the Pioneer Oil & Refining Co. owns 26 tank cars, three bulk stations and three service stations.

## Medal Given C. E. Parker For Saving Life

TULSA, Dec. 27.—Presentation of the National Safety Council president's medal to Carl E. Parker, an employe of the Pure Oil Co. refinery at Muskogee, was a gala event of Dec. 16. Approximately 1200 persons attended the banquet.

The banquet was sponsored by the National Safety Council, the Mid-Continent Oil & Gas Association, the Petroleum Safety Council, with the cooperation of the Pure Oil Co.

D. J. Wallace, safety director of the Mid-Continent Oil & Gas Association was toastmaster. An address of welcome was given by E. R. Kerr, vice mayor of Muskogee.

Employes of the Pure Oil Co. refinery at Muskogee staged a drama, "Gateman Bill." H. W. Boggess, safety director, Sinclair Oil & Gas Co., Tulsa, spoke on "The Ruts of Life," and C. L. Swim, manager of the insurance department of Skelly Oil Co., discussed "The Value of Safety Education." A demonstration of artificial respiration was also given.

The medal was presented to Mr. Parker by Elmo D. Murphey, safety director of the Mid-Continent Petroleum Corp., and representative of the National Safety Council.

The medal was given to Mr. Parker for his work in saving the life of Miss Wyota Sue Dennison of Idabel, Okla. on July 4, 1929. Miss Dennison was swimming with a party of friends at Vann's lake, near Muskogee, and was nearly drowned.

She was taken from the water in an unconscious condition and her life saved by the timely application of the Schaefer prone pressure method of artificial respiration, administered by Mr. Parker with the assistance of Meredith E. Rogers.

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**Tide Water Orders Two Tankers**

NEW YORK, Dec. 27.—Tide Water Associated Transportation Co. has contracted for two 13,450-ton tankers from the Sun Shipbuilding & Drydock Co. which has yards at Chester, Pa. The tanks will be powered with diesel engines and have a speed of approximately 11 knots an hour. A loan of $2,602,050 for the building has been approved by the United States Shipping Board.


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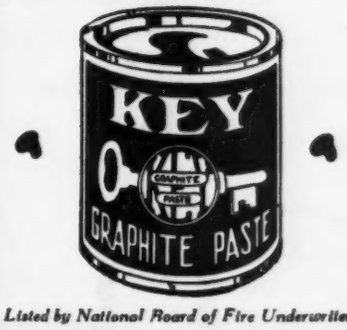
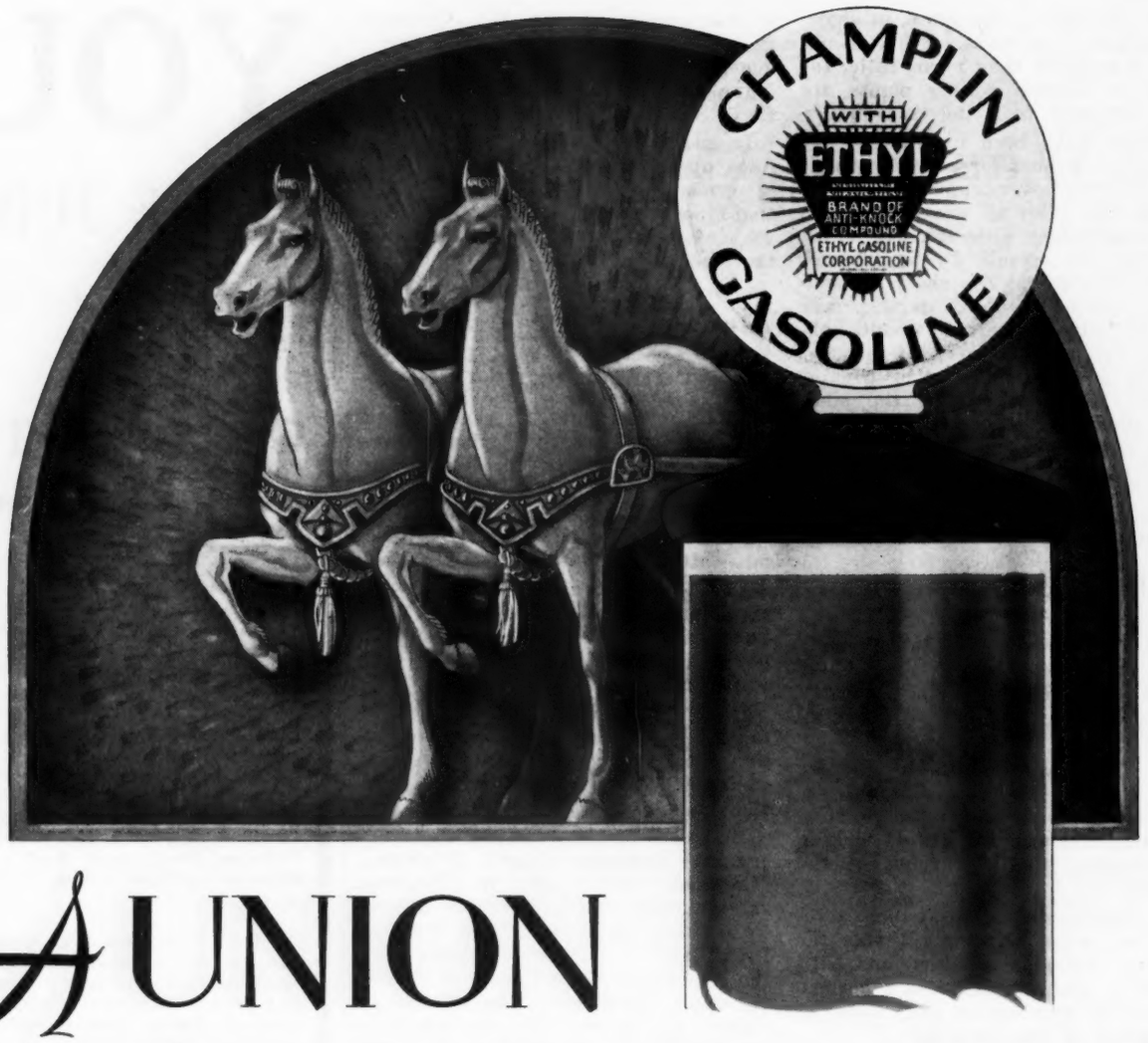
Address .....

Requested by .....




*Listed by National Board of Fire Underwriters*




# A UNION

## *that is making great strides for*

USE CHAMPLIN OILS WITH ETHYL BRAND OF ANTI-KNOCK COMPOUND ETHYL GASOLINE CORPORATION

## LICENSED CHAMPLIN JOBBERS

The selling power of Champlin Gasoline is time-tested and proved. Through its union with Ethyl anti-knock fluid, which has swept to world recognition as a great scientific formula,—a demand has been created for Champlin Ethyl that is paying big dividends to licensed Champlin jobbers.

Champlin Gasoline, forming the basis for Champlin Ethyl, is refined from high gravity, paraffin-base, sulphur-free Mid Continent crude, and stands all doctor and corrosion tests. When Ethyl anti-knock fluid is added, the resultant product is a quick-starting, clean-burning, anti-knock, smooth-power-delivering motor fuel. It is available to all Champlin jobbers holding approved Ethyl license agreement. Particulars furnished on request. Wire, phone or write the

Champlin Refining Company
Enid, Oklahoma

# CHAMPLIN

# How Story of Fifty Years in Business Was Told Public by Wadhams

WADHAMS
OIL & GREASE CO
Farther back
than "way back when"
ABOUT the first recognition of petroleum in its "public service" aspect came with the introduction of the tank delivery wagon. Before that, folks had to carry their kerosene cans to the grocery store—all drippy and dauby despite potatoes clapped over the spouts that were forever losing their stoppers . . . So the wagon idea caught on. How modern it seemed then and how far back now. Yet long ago as it was, Wadhams had then been established a score of years!
Thirty more years have rounded out a full half century, milestoned throughout its span by repeated evidences of Wadhams progress, innovation and expansion in betterment of public petroleum service. What achievement has been realized through these years is convincingly revealed by the four selected products that today bear the Wadhams name:—
1929
1879
50 years
Wadhams 370
Wadhams Anti-Knock
Wadhams Specials
"Extra Value—always"
Wadhams of Wiscor

MILWAUKEE

THAT it was completing its fiftieth year in business was the theme of a recent advertising campaign of the Wadhams Oil Corp., Milwaukee, in newspapers throughout Wisconsin, the company's retail marketing territory.

The company had reached a ripe age, as independent oil marketing organizations go, and wanted to tell this story through its territory. Institutional advertising, illustrated with pictures comparing events of 1879 with those of 1929, was used to tell the story. The 50 years was worked in by using the wording "1929, 1879, by subtraction 50 years" across the face of the advertisements.

Preliminary to the general campaign teaser advertisements were used in leading newspapers in Milwaukee, and in prominent papers in the state. These advertisements were 6¼ inches wide and 7 inches deep.

The teaser campaign featured the 50 years in business by using the two dates and the subtraction. These figures were about an 1½-inch deep. Each teaser advertisement also used the comparison scenes.

An accompanying illustration shows one of the teasers, with the picture of an airplane and a horse-drawn street car. Other comparison pictures were the automobile and high wheel bicycle, a passenger train and the prairie wagon westward bound, a zeppelin and the old county fair type balloon, a yacht and the old horse-drawn barge, and a modern roadster and the buggy.

The teaser campaign was to concentrate the attention of consumers in Wisconsin upon the 50-year theme. No hint was given as to what the campaign might reveal. The illustrations, comparing the progress made in these 50 years, also tied into the general campaign. For four days each section of all Milwaukee news-

1929
1879
by subtraction —
50
years old
Wadhams founded 1879
EVEN as mere figures, 50 years in an industry as new as petroleum, carry a significance that cannot be misread.
But the true importance of this Wadhams span is not written in the passive mathematics of by-gone times.
In living letters of the present the track stands large that through this half-century of pioneering . . . . of progress . . . . of prestige . . . . of public repute for stability and responsibility, this Wisconsin institution has moved with brow to the front to build a business that is emphatically of today . . . . and tomorrow!
And so it should be, this advancing spirit is crystallized for public participation through the Wadhams products — built for you because safe to uphold the Wadhams fifty-year old name.
Wadhams 370
Wadhams Anti-Knock
Wadhams Specials
Wadhams
Tempered Motor Oil
30
"Extra Value-Always!"
Wadhams of Wisconsin

*Typical advertisements published by Wadhams Oil Corp. in its institutional series on being in business for 50 years*

*You Have Heard a Lot About*

# GALENA MOTOR

## What Does This Process Mean?

. . . . .

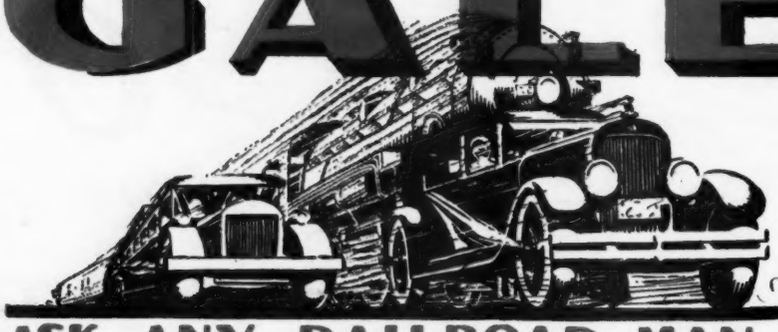
. . . . . Is Galena PROCESS just another "catch" phrase? . . . Does it do anything to the oil —improve it? . . . Has it really the merits claimed for it?

. . . . .

ABSOLUTELY! . . . If it were a NEW PROCESS, it might be open to question—but do you realize that Galena has been processing its oils by this very same method for over sixty years? Then, if you will look into the history of Galena lubrication, these sixty years will tell whether or not the PROCESS *has* merit.

Can you imagine a harder field to lubricate than the railroads? Consider their high speeds, tremendous tonnage, long runs, adverse conditions and the millions of journal miles made daily. . . . That has been Galena's proving grounds since 1869 Every famous railroad record—for speed, distance, tonnage—was made with Galena Lubricated trains. When the United States Government moves its huge coastal defense guns to the Pacific Coast, Galena Oils are commanded. . . . . Galena has won First Awards at every World's Fair since

**GALENA**



**PROCESSED OILS**

**ASK ANY RAILROAD MAN - *HE* KNOWS *GALENA***

# PROCESSED OIL...

1869. And that's only a small part of Galena's unmatched records.

If Galena had stopped with the development of its PROCESS, it would have been a wonderful job well done. But in addition, a most comprehensive, vital and practical advertising and merchandising program has been definitely worked out in detail. With it, Galena offers a combination—product and selling plans—that is unmatched for quality and effectiveness.

... We want progressive, substantial marketers to program with us, share our success and become our co-partners.... Can you qualify? ... Let's find out.... Return the coupon.

**Why does GALENA PROCESS give its oils such outstanding qualities? .... There are *definite* reasons.**

1. Galena is 100% Pure Pennsylvania Oil PLUS!
2. By Galena's exclusive process, each tiny globule of oil is tremendously strengthened, toughened, *armorized*. Its record proves it does not break down under long runs and high speeds.
3. Galena penetrates and adheres to the very grain or pores of the metal—becomes an integral part of it. Every moving surface, every bearing, ALWAYS has an oil film on it. The Piston seal is vastly strengthened and toughened.
4. From the first turn of the starter, you have oil rolling against oil—not metal against metal. There's no unlubricated surface—a tremendous saving of motor life.
5. Galena Processed Oils are richer in oiliness—have a stronger protecting film that gives smoother motor performance—greater power—longer life—more mileage.
6. Tests prove it takes 25% less battery power to turn over the motor. *Quick starting and immediate lubrication.*

From Franklin, Penna.

## GALENA OIL CORPORATION

CHICAGO OFFICE: 80 EAST JACKSON BOULEVARD

***Pioneers in Safety and Service Since 1869***

GALENA OIL CORPORATION, 80 East Jackson, Blvd., Chicago, Ill.

Gentlemen: Yes, I am interested in Galena Oil. Without obligation, give me full details.

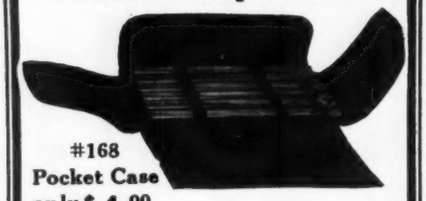
*Name* .....

*Firm* .....

*Address* .....

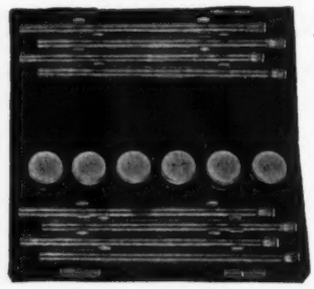
*City* ..... *State* ..... 1-1-30

**Pocket Sample Cases**



#168
Pocket Case
only $4.00

Sturdily constructed from black cobra grain cowhide. Lined with red plush. Contains six bottles. 9"x3½".



175—This case contains eight 9-inch bottles and six grease jars. Made from black cobra grain cowhide, lined with red plush. Has two serviceable nickel slide catches, price including metal capped corks, only ..... $7.00

*Less 10% for Cash*

*Other styles in our FREE Catalog*

**L-U-C-E**

*Builders of Sales Luggage*

614 Delaware Kansas City, Mo.



Trade Leader Mark

**AIR UNITS**

*deliver* **CARE-FREE, OIL-FREE AIR**

**Freedom from Common Complaints** is the first thing about Leader Feather-Valve Air Units that appeals to the station operator.

**Freedom from Air Leaks** is assured by Leader Rivet-Weld Leak-Proof Tanks, and careful, masterful assembly of the entire unit.

**Air Is Delivered Free from Oil.** This is accomplished by using automobile-type pressure lubricating system.

**Laidlaw Feather Valves**—the lightest, finest air compressor valves made—are used exclusively in these compressors.

Write for full description and prices.

**LEADER IRON WORKS**

2112 N. JASPER ST., DECATUR, ILL.
21 E. 40th St., New York, N. Y.


papers published one of the teaser ads, and these were scheduled also in the larger papers throughout the state.

When the stage had been set by the teaser ads, the general campaign was issued. These advertisements took up full pages in Milwaukee newspapers, and somewhat smaller space in state papers.

This campaign also featured the progress made in the 50-year span of Wadham's life, subordinating advertising on the products sold by the company.

One of these advertisements carried the picture of the operator of, what Wadham's terms, the first drive-in filling station in the northwest. The text tells how gasoline used to be sold from hardware stores, garages, and auto agencies, and that Wadhams ventured out in building a store devoted to selling gasoline and oil for the automobile. The text also places the opening of this station in 1912, seventeen years ago, and then tells how at that time the Wadhams company was 33 years old. The attendant at this first station now works at the Second Street Parking Station, 2nd St., Milwaukee.

Another advertisement is illustrated by the horse-drawn tankwagon. The text tells how the tankwagon was the first recognition of petroleum products in its "public service" aspect, but, even when that method of delivery came in, Wadhams was established for a score of years.

This advertisement also traces the name Wadhams through the various companies in Milwaukee that operate today as the Wadhams Oil Corp. The first organization was known as Isted, Wadhams & Halsted, beginning in 1879. In 1883 the name was changed to Wadhams, Magee & Co.; in 1887 to Wadhams Oil & Grease Co.; and in 1903 to the Wadhams Oil Co. With the merger of Bartles-Maguire Oil Co. last summer the name was changed slightly, now being the Wadhams Oil Corp.

These dates, with the names of the organization, are published in smaller type in the text. The name Wadhams is circled.

Two advertisements depicted typical scenes and events of 1879 when the company was found. One advertisement had, as the central figure, a picture of three men grouped around the living room table, going over papers in organizing the Isted, Wadhams & Halsted company. On each side were drawings of other events of that year: the first cash register was built, Woolworth opened his first 5 and 10 cent store in Utica, N. Y., the New York elevated was opened to traffic, and the incandescent light was invented.

The other advertisement of this type was illustrated with another set of events of 1879: Hayes was president, the poney express was running, there were no ice cream sodas, it

*One of the small advertisements of the teaser campaign*

was 14 years after the Civil war, men wore shawls, Wm. E. Smith was governor of Wisconsin, there were Indian wars, women wore bustles, there were only 38 states in the union, and the high wheel bicycle was termed a "boneshaker."

In each advertisement, usually at the bottom, a small amount of space was given to the three grades of gasoline and the motor oil sold by Wadhams. There were four illustrations, the name of the grade being lettered on a gasoline pump globe, and a miniature figure of the pump at the side. Beneath was a text of about 30 words telling of the quality of the product. The grades of gasoline are identified by the "370" gasoline being sold at the yellow pump, anti-knock gasoline at the red pump, and the SpeciaLo grade at the black pump. Wadhams Tempered motor oil, illustrated by a quart oil bottle by a large W, was the fourth product advertised.

Signature was "Wadhams of Wisconsin," and did not carry the full name of the company, thus tying up the company as a state wide organization.

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**Columbian Steel Has House Organ**

KANSAS CITY, Mo.—"The Columbian Marketer" made its debut among oil industry house organs in December. It will be published monthly by the public relations department of the Columbian Steel Tank Co. here. Merrill V. Nipps, head of that department, is editor.

This publication is intended to establish a friendly contact between the company's buyers and users of oil marketing equipment.

Trucks, on which are mounted tanks for gasoline and oil delivery, such as are made by the Columbian company, are afforded front page space in stories telling of successful oil marketers who have developed and increased their business with the use of trucks, as well as through truck driver salesmen.

ADVERTISING PAGES REMOVED

# "A Home-Owned Company" Helps Its Business

TERRE HAUTE, Ind.

THE "trade with home owned companies" appeal is used by the Culley Oil Co., here, in its efforts to obtain a share of the consumer's gasoline and oil dollar. That appeal is made through direct mail pieces, with the line "'Food for thought.' The Culley Oil Co. is the only home owned oil company in your city, with five service stations for your convenience" published on the letters.

Direct mail pieces are used extensively by the company in its merchandising efforts. The Culley Oil Co. is distributor for Pennzoil, and many of its letters are tied in with the Pennzoil Co.'s dealer merchandising helps.

One of the direct mail pieces is used in soliciting business from other companies in Terre Haute. This is a letter sent with every check mailed by the Culley Oil Co. A sample of this type of letter is reproduced herewith. Copy is changed frequently to prevent sending the same letter with accounts payable that come up each month; as the telephone, gas, or electric light bills.

The foundation of this letter is a four page folder of the Pennzoil Co. In the center spread are illustrations and testimonials for motor oil used in airplanes and in autos. The back page is blank, and the front page carries the letter from the Culley Oil Co. Printing is in two colors, red and black.

Harry D. Culley, owner of the company, is not striving for 100 per cent of the gasoline and oil business of the firms that he patronizes. He works on the theory that when he spends his money, that company in turn should patronize his oil stations for a reasonable share of its petroleum needs.

The same folder is used also as the foundation for a letter sent to all crankcase drain customers. The day following the crankcase change the letter is mailed to the customer. Addresses are compiled from the "drainage rack report," filled in by the station attendant. The attendant also tries to find out how much the auto is driven for information in gauging the mailing of the 1000 mile oil change reminder card.

A penny post card oil change reminder is mailed to crankcase customers at the end of a month, or sooner if the attendant reports the car is driven much. This card carries the address of the station where the previous oil change was purchased, and is signed by the attendant.

Favorable response was obtained from a recent mailing of 300 cards, printed on good paper stock, to members of local service luncheon clubs. These cards were not keyed, but many customers remarked to station attendants about receiving a card.

A similar card is to be mailed by attendants at the five service stations. Men at each of the stations are to go through a city directory, picking out addresses of 50 automobile owners in the vicinity not patronizing the station, to compile a mailing list. These cards will carry the address of the station, and will be signed by the attendant.

All mail pieces sent out by the company carry the name of the Culley Oil Co. Mr. Culley adopted this policy as protection for himself, as well as linking his name with nationally advertised products.

A letter mailed several years ago, based entirely on the "trade with home owned companies" follows:

Dear Sir:

"Please let us take enough of your valuable time to explain a few of our reasons why Terre Haute people should trade with home-owned firms who manufacture or supply a good product.

"The profits on money spent with a home concern generally remain in Terre Haute, and is spent in some way with other local firms, or is invested in your city.

"We are sincere in expressing our views of this situation, and feel that if every citizen of our city would purchase from home owned concerns, we would help the general business conditions of Terre Haute, because the profits would still be here in our city.

"We hesitate just a moment before making a purchase, and ask ourselves a question: 'Will our money remain in Terre Haute, or will it be sent by draft tomorrow to New York, Chicago, or some other headquarters of a foreign owned company?'

"We assure you that we do at all times favor Terre Haute, and its home-owned businesses of all kinds."

Yours very truly,
CULLEY OIL COMPANY,
By

---

NEW YORK, Dec. 27.—To discuss the application of cast steel side frames on trucks of tank cars a joint conference is being planned for the American Petroleum Institute, American Railway Association, and the Manufacturing Chemists Association. A resolution requiring this application was adopted at the annual meeting of the mechanical division of the railway association. The meeting may be held in January at New York or Chicago.

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**Future of Oil-Electric Locomotives**

CLEVELAND, Dec. 26.—That the oil-electric locomotive may be used extensively on railroad lines where traffic is too light for electrification was predicted by A. W. Robertson, chairman of the Westinghouse Electric & Mfg. Co., in a review of the electrical business of 1929 with prospects for 1930. The Canadian National railways last year placed in service an oil-electric locomotive on a main line. The review pointed out that oil-electric drive has been used extensively on tankers, tug boats, and ferries; that electric welding is being used on long pipe lines and that the use of electrically operated drills and pumps for wells and pipe lines increased in 1929.

—*International News Photo, Inc.*

*An oil-electric locomotive on the Canadian National Railways hauling a section of the International Limited, crack train from Montreal to Chicago. The locomotive uses but one fifth to one fourth of fuel in a steam locomotive, and does away with a third rail or other power distribution lines of an electric locomotive. The locomotive weighs* 650,000 *pounds. Power developed by the oil engine is converted into electricity for driving the engine*

# Compilation Of Mid-Continent Refinery Operations

*All Rights Reserved to The National Petroleum Publishing Co.*

National Petroleum News

## Mid-Continent Refinery Operations Week Ended December 27 (By Telegraph)

| | Kansas | Oklahoma | North & Cent. Texas | West Texas | North La.-Ark. | Total Week Ended Dec. 27 |
|---|---|---|---|---|---|---|
| Plants Reporting..... | 12 | 29 | 25 | 15 | 12 | 93 |
| Da. Av. Cap. (Bbls.).. | 92,000 | 160,200 | 86,600 | 81,500 | 54,900 | 475,200 |
| Da. Cracking Capacity | 30,700 | 52,600 | 17,200 | 5,000 | 22,700 | 128,200 |
| Da. Av. Crude Runs.. | 58,725 + 8.2 | 113,316 — 2.3 | 62,026 — 9.0 | 33,928 + 6.7 | 51,692 — 8.1 | 319,687 — 2.1 |
| Da. Av. Other Oils... | 8,089 + 7.4 | 3,720 — 53.2 | 4,713 +134.1 | 1,137 + 33.8 | 1,211 — 36.7 | 18,870 — 10.5 |
| **GASOLINE—Gallons** | | | | | | |
| Stocks, Dec. 20..... | 20,677,000 | 56,607,000 | 18,995,000 | 11,738,000 | 10,436,000 | 118,453,000 |
| Prod. 12-20 to 12-27.. | 10,215,000 + 1.2 | 17,186,000 — 7.7 | 8,332,000 — 6.3 | 3,382,000 + 18.6 | 5,089,000 — 9.9 | 44,204,000 — 4.1 |
| Ship. 12-20 to 12-27... | 7,474,000 — 8.5 | 12,509,000 — 7.9 | 6,165,000 — 18.4 | 1,809,000 — 40.2 | 4,072,000 + 0.2 | 32,029,000 —12.0 |
| Stocks, Dec. 27..... | 23,418,000 + 13.3 | 61,284,000 + 8.3 | 21,162,000 + 11.4 | 13,311,000 + 13.4 | 11,453,000 + 9.7 | 130,628,000 +10.3 |
| Ratio Sales to Prod... | 73.2% | 72.8% | 74.0% | 53.5% | 80.0% | 72.5% |
| **KEROSENE—Gallons** | | | | | | |
| Stocks, Dec. 20..... | 14,853,000 | 7,246,000 | 2,665,000 | 4,000 | 1,738,000 | 26,506,000 |
| Prod. 12-20 to 12-27.. | 1,737,000 + 33.0 | 2,679,000 + 5.1 | 1,461,000 — 16.0 | 63,000 | 96,000 — 87.9 | 6,036,000 — 5.5 |
| Ship. 12-20 to 12-27... | 1,352,000 — 15.1 | 2,105,000 — 34.6 | 1,509,000 — 29.0 | 10,000 — 70.6 | 241,000 — 27.2 | 5,217,000 — 28.6 |
| Stocks, Dec. 27..... | 15,238,000 + 2.5 | 7,820,000 + 7.9 | 2,617,000 — 1.9 | 57,000 + 42.5 | 1,593,000 — 8.4 | 27,325,000 + 3.1 |
| Ratio Sales to Prod... | 77.8% | 78.6% | 103.3% | 15.9% | 251.0% | 86.4% |
| **STOVE DISTILLATE—Gallons** | | | | | | |
| Stocks, Dec. 20..... | 3,324,000 | 5,582,000 | 1,066,000 | 101,000 | 85,000 | 10,158,000 |
| Prod. 12-20 to 12-27.. | 917,000 — 10.6 | 1,243,000 — 37.5 | 227,000 + 7.1 | 54,000 — 28.0 | 196,000 + 55.5 | 2,637,000 — 23.1 |
| Ship. 12-20 to 12-27.. | 763,000 + 46.4 | 1,718,000 + 26.5 | 295,000 — 43.3 | 43,000 — 52.7 | 155,000 — 47.8 | 2,974,000 + 6.7 |
| Stocks, Dec. 27..... | 3,478,000 + 4.6 | 5,107,000 — 8.5 | 998,000 — 6.4 | 112,000 + 10.9 | 126,000 + 48.2 | 9,821,000 — 3.3 |
| Ratio Sales to Prod... | 83.2% | 138.2% | 130.0% | 79.6% | 79.1% | 112.8% |
| **GAS OIL—Gallons** | | | | | | |
| Stocks, Dec. 20..... | 3,576,000 | 38,421,000 | 3,402,000 | 10,741,000 | 3,985,000 | 60,125,000 |
| Prod. 12-20 to 12-27.. | 1,359,000 — 14.4 | 2,425,000 — 12.4 | 465,000 — 62.2 | 909,000 + 15.9 | 2,046,000 + 0.9 | 7,204,000 — 14.2 |
| Ship. 12-20 to 12-27... | 1,743,000 + 16.2 | 2,201,000 + 4.3 | 810,000 + 59.1 | 659,000 — 29.0 | 1,750,000 — 9.0 | 7,163,000 + 2.8 |
| Stocks, Dec. 27..... | 3,192,000 — 10.7 | 38,645,000 + 0.6 | 3,057,000 — 10.1 | 10,991,000 + 2.3 | 4,281,000 + 7.4 | 60,166,000 + 0.06 |
| Ratio Sales to Prod... | 128.3% | 90.7% | 174.2% | 72.5% | 85.5% | 99.4% |
| **FUEL OIL—Gallons** | | | | | | |
| Stocks, Dec. 20..... | 11,139,000 | 31,958,000 | 68,766,000 | 18,007,000 | 21,069,000 | 150,939,000 |
| Prod. 12-20 to 12-27.. | 4,812,000 + 10.6 | 6,670,000 + 12.3 | 8,244,000 + 1.2 | 4,157,000 — 4.4 | 5,792,000 + 3.0 | 29,675,000 + 4.5 |
| Ship. 12-20 to 12-27.. | 5,222,000 + 11.7 | 6,612,000 — 17.9 | 8,006,000 + 16.7 | 6,307,000 — 3.5 | 3,817,000 — 44.7 | 29,964,000 — 9.3 |
| Stocks, Dec. 27..... | 10,729,000 — 3.7 | 32,016,000 + 0.2 | 69,004,000 + 0.3 | 15,857,000 — 11.9 | 23,044,000 + 9.4 | 150,650,000 — 0.2 |
| Ratio Sales to Prod... | 108.5% | 99.1% | 97.1% | 151.7% | 65.9% | 100.9% |

## Gasoline Produced by Various Methods, Week Ended December 27

| | Kansas | % of Total | Oklahoma | % of Total | North & Cent. Texas | % of Total | West Texas | % of Total | Louisiana-Arkansas | % of Total | Total | % of Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Straight Run..... | 6,720,000 | 65.8 | 11,146,000 | 64.9 | 5,743,000 | 68.9 | 3,186,000 | 94.2 | 1,946,000 | 38.2 | 28,741,000 | 65.0 |
| Cracked..... | 2,717,000 | 26.6 | 4,950,000 | 28.8 | 1,902,000 | 22.8 | 66,000 | 2.0 | 2,744,000 | 53.9 | 12,379,000 | 28.0 |
| Natural..... | 778,000 | 7.7 | 1,090,000 | 6.3 | 687,000 | 8.3 | 130,000 | 3.8 | 399,000 | 7.9 | 3,084,000 | 7.0 |
| Total..... | 10,215,000 | | 17,186,000 | | 8,332,000 | | 3,382,000 | | 5,089,000 | | 44,204,000 | |

**+ or — columns are % change over previous week.**

# Gasoline Shipments at Low Point for 1929

Staff Special—By Telegraph
TULSA, Dec. 30

FOR the second consecutive week gasoline stocks at 93 Mid-Continent refineries that report weekly operating data to NATIONAL PETROLEUM NEWS, showed a sizable increase. Increase in the week ended Dec. 27, amounted to 12,000,000 gallons. Stocks were increased in each district.

Crude runs were reduced 7000 barrels daily average with each district except Kansas and West Texas sharing in the reduction. These two districts had an increase of 6500 barrels daily average.

Gasoline production was 2,000,000 gallons lower than production in the week ended Dec. 20. Shipments were 4,400,000 gallons lower. With shipments at 32,029,000 gallons a new low mark for the year was set. Former low was in the week ended

## Summary for the Month

Production and shipments, all reporting refineries, for four weeks ended Dec. 27. Change in stocks figures from Nov. 29.

**GASOLINE**

| | Gallons |
|---|---|
| Production | 178,738,000 |
| Shipments | 153,115,000 |
| Net change in stocks | +25,623,000 |
| Ratio sales to production | 85.7% |

**KEROSENE**

| | |
|---|---|
| Production | 24,646,000 |
| Shipments | 23,735,000 |
| Net change in stocks | +911,000 |
| Ratio sales to production | 96.3% |

**STOVE DISTILLATE**

| | |
|---|---|
| Production | 10,851,000 |
| Shipments | 11,092,000 |
| Net change in stocks | —241,000 |
| Ratio sales to production | 102.2% |

**GAS OIL**

| | |
|---|---|
| Production | 32,990,000 |
| Shipments | 33,403,000 |
| Net change in stocks | —413,000 |
| Ratio sales to production | 101.3% |

**FUEL OIL**

| | |
|---|---|
| Production | 114,087,000 |
| Shipments | 130,329,000 |
| Net change in stocks | —16,242,000 |
| Ratio sales to production | 114.2% |

Feb. 15 with total of 32,400,000 gallons.

Kerosene stocks were increased 800,000 gallons with both production and shipments lower.

Colder weather caused substantial increase in distillate demand and stocks were reduced 300,000 gallons.

Gas oil stocks were increased slightly with production down and shipments up.

Fuel oil stocks were increased slightly with shipments and production almost in balance.

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CHICAGO, Dec. 28.—Jay Trexler, director of the Red Hat department of the Independent Oil Men of America, has resigned that position effective Jan. 1. His future plans will be announced later.

---

### Hickok Plans Expansion

TOLEDO, Ohio, Dec. 27.—Further expansion of marketing outlets of the Hickok Producing Co. will be made adjoining present outlets in Michigan in 1930. The company plans to buy existing outlets or erect new stations. Hickok will begin marketing its products through the Abbott Gasoline Co., Ann Arbor, Mich., on Feb. 1. An interest in the Abbott company was purchased by Hickok several months ago. Abbott has a bulk plant at Ann Arbor, and 24 service stations in and around the city.

---

### Corrections

These refinery prices applied on Dec. 23 instead of those published under that date in the Dec. 25 issue:

Chicago resale market: 28-30 zero fuel oil, $1.175 to $1.25, instead of $1.175 to $1.20.

Natural gasolines: Oklahoma Grade BB and C, 5.50 to 5.625 cents, instead of 5.625 cents flat.

Neutral oils: Oklahoma, 200 No. 3, 10.50 to 12 cents; 280 No. 3, 16 to 17; 280 No. 4, 14 to 16; and 280 No. 5, 13 to 15 cents.

Gas and fuel oils: Oklahoma, 32-36 dark zero gas oil, 3.375 to 3.50 cents, instead of 3.25 to 3.50 cents; North Texas, 24-26 fuel oil, $0.75 to $0.80, instead of $0.70 to $0.80.

In New York Export Market, page 113 of the Dec. 25 issue, prices of two fully refined waxes were in error. On Dec. 23 130-132 A.m.p. wax was 4.75 to 5.00 cents, instead of 5.00 to 5.25 cents, and 135-137 A.m.p. wax was 6.00 to 6.25 cents, instead of 6.125 to 6.375 cents.

---

### Late Market Changes

Price changes arriving too late to include in the regular market tables of this issue, as of Dec. 30, are:

Refiners' and Compounders' Supply table: Linseed oil, carloads, 14.60; in tanks, 13.80; in naval stores supplies, steam distilled turpentine, New York, 50; at Savannah, 45; gum turpentine, Savannah, 47.50; gum rosin, New York, 8.40; at Savannah, 6.75; rosin oil, pure, 59; compounded, 60.

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# Refinery - Tank Wagon Markets

National Petroleum News

# Gasoline Prices Drop 0.125 to 0.25 Cent in Majority of Markets

CLEVELAND, Dec. 30

TANK car markets for the majority of commodities were extremely quiet in all sections of the United States during Christmas week. With the exception of gasoline and zero burning oils, prices were lacking in definite trends.

Negotiation of short and long term 1930 contracts continued to occupy the attention of most traders. Very little interest was displayed in spot markets.

Atlantic seaboard gasoline markets were the only ones to buck the general trend of prices for this commodity. Some shading of posted prices was reported in various east coast markets, but unlike other major trading centers, there were no changes in general quotations.

Reductions of from 0.125 to 0.25 cent in prices for U. S. Motor gasoline were noted in the Chicago resale market, California bulk and tank car markets, western Pennsylvania refinery market and all Mid-Continent markets.

The Chicago market continued to stand out prominently from other middle west markets in that gasoline prices there remained a jump or two ahead of them throughout the week in a downward move. U. S. Motor was offered to the trade by Chicago carlot marketers at 6.25 cents and less, Group 3, for shipment from almost any section of the Mid-Continent, whereas 6.375 cents was reported the minimum which a buyer could do in buying direct from the Mid-Continent.

Large volume buying of and inquiries for kerosene in Pennsylvania was a feature of the market for the lighter burning oils generally. Several 10 and 15 car sales of 45 water white were reported there with orders for as much as 50 cars seeking attractive bids.

Burning oil prices reacted downward slightly as a result of milder weather which prevailed generally over the eastern half of the country. There were, however, substantial price advances recorded by the low cold test grades due to their relative scarcity.

Lubricating oils generally were unchanged, although bright stock in both Pennsylvania and the Mid-Continent showed price recessions of from 1 to 2 cents per gallon.

Wax markets were quiet, with prices for white crude scale easing off 0.125 cent at New York and New Orleans. There was no change in quotations for this commodity in the Mid-Continent.

# Chicago Prices Slip in Quiet Trading

Staff Special

CHICAGO, Dec. 28

THE Chicago resale market last week was in the apathetic state which is generally apparent just prior to the end of the year and the inventory period. Buyers generally were ordering only enough goods for their immediate requirements and in the case of gasoline and kerosene, these were not very heavy. The severe storm of the past week left roads in poor condition and off the main traveled highways there was not much motoring.

The spot market on U. S. Motor gasoline was virtually at a standstill and many sellers reported only doing routine business. The slack demand had its effect on prices and goods were offered by Chicago carlot marketers at 0.125 to 0.25 cent lower than at the end of the previous week. They reported being offered U. S. Motor for resale in Oklahoma, north and west Texas at 6 cents. Marketers' sales to the jobbing trade on Dec. 28 were generally at 6.25 to 6.50 cents, with one or two sellers offering goods at 6.125 cents.

A price range of 6.75 to 7 cents generally represented the highs of the U. S. Motor gasoline market in Chicago. Sales were reported at these figures by both Oklahoma and Chicago district refiners. Several Oklahoma refiners continued to quote U. S. Motor at 7.25 cents.

Many sellers reported a better demand for the 64-66, 375 and 68-70, 350-360 e.p. gasolines than for the U. S. Motor grade and prices of these two products were generally unchanged over the previous week. Very little goods were reported available under 7.75 cents and 8.25 cents, respectively.

Demand for kerosenes continued light. A number of sellers reported no difference in price between the low of the kerosene market and the high of the distillate market. Sales of 41-43 w.w. kerosene were reported at 4 cents and of the 42-44 w.w. at 4.375 cents.

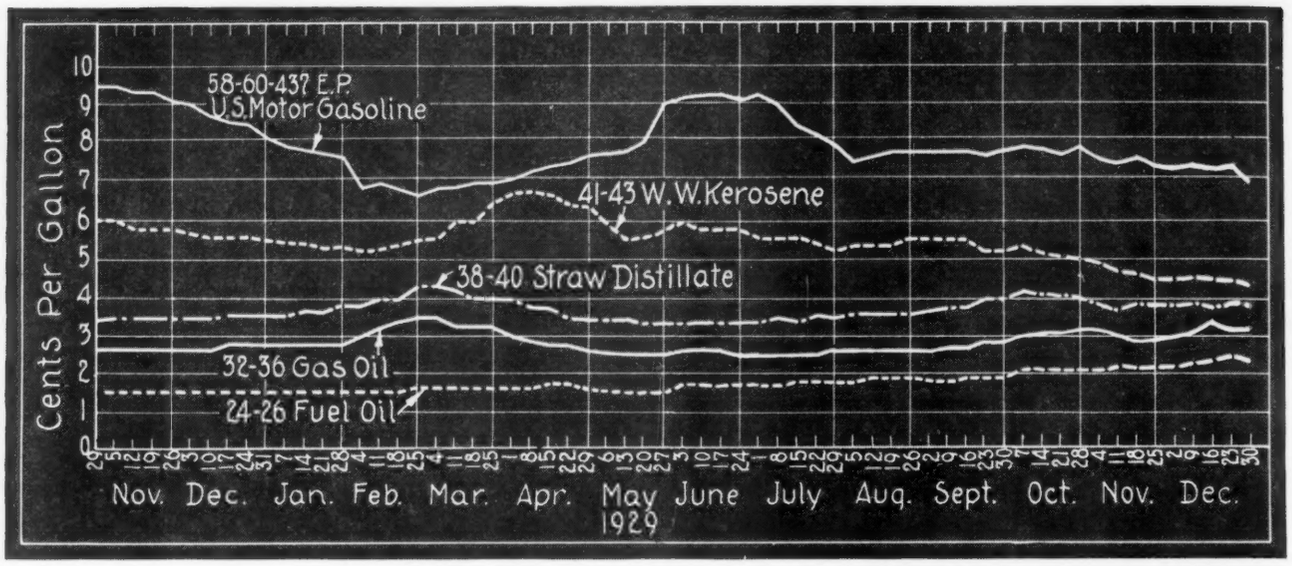
Tank wagon distributors of furnace oils reported an excellent demand the first part of the week, with a slowing up in orders the latter part. Most of them attributed the slackening in demand to the mild weather. However, this was not unwelcome in many quarters, as a number of distributors said they were somewhat behind on deliveries and this would give them a chance to catch up.

Distillates were in steady demand in the tank car market, although little change was apparent in prices. Some sellers reported moving the 38-40 grade freely at 3.75 cents, while others said they were able to get 4 cents.

Zero grades of gas oil were reported in good demand and a number of sellers advanced their prices. However, the price ranges on the 32-36 dark zero and 32-36 straw zero oils remained unchanged at 3.25 to 3.375 cents and 3.375 to 3.50 cents, respectively. Sales of 32-36 straw zero also were reported at 3.625 cents.

Practically the same situation was reported on the fuel oils as on the

## Current Prices of Principal Mid-Continent Refined Products




*Prices shown are in Group 3 basis and extended to date shown in Refinery Market Tables Section of this issue*

zero gas oils. Several grades, notably 28-30 and 18-22 zero, were still being offered in only a few sources for prompt shipment. Several sellers advanced their prices on these two grades. Most sellers quoted $1.20 to $1.25 on the 28-30 zero fuel, with occasional sales reported as high as $1.30. However, one or two buyers reported picking up occasional cars of this grade in transit at around $1.10. These goods were offered by distributors who had already ordered the goods shipped, but were unable to use their commitments.

More activity was noted in industrial gas oils as several sellers reported inquiries fairly numerous. These were mostly for shipment over January. The 32-36 ordinary dark gas oil still was offered at 2.75 to 3 cents although several sellers, who had formerly quoted 2.75 cents, advanced their quotations to 2.875 cents.

### Sells Output Abroad

TULSA, Dec. 28.—The gasoline output of the White Oak Oil & Refining Co., for January, February and March has been sold to English and French exporters, according to Victor H. Smith, president. The gasoline will be handled through the Gulf States Terminal & Transport Co. of which the White Oak company is a subsidiary.

Mr. Smith also has announced the White Oak company has asked for bids on a 3,500-barrel refinery to be built opposite the terminal on the Gulf at Westwego, La. Mr. Smith meanwhile has left Tulsa for New York where on Jan. 3 he will sail for Europe on a business trip.

## Shipments From Southern California

LOS ANGELES, Dec. 26.—Bulk petroleum shipments from Southern California ports for week ending Dec. 21, were as follows:

| Destination | Crude | Gasoline | Diesel | Distillate | Kerosene | Fuel | Gas-Oil |
|---|---|---|---|---|---|---|---|
| Pacific For. | 52,703 | 74,274 | 2,881 | ..... | 68,395 | 399,053 | ..... |
| Atlantic Dom. | ..... | 515,605 | 49,719 | 80,000 | 53,120 | ..... | 74,263 |
| Atlantic For. | ..... | 183,627 | ..... | ..... | ..... | ..... | ..... |

### Exports from Tampico District

| Company | October | November |
|---|---|---|
| Transcontinental-Rayon Cos. (Standard of New Jersey) | 311,068 | 75,073 |
| Huasteca Petroleum Co. (Pan American) | 843,621 | 761,135 |
| Mexican Eagle Oil Co. Ltd. (El Aguila) | 661,642 | 576,964 |
| Cia. Mexicana Holandesa "La Carona" | 111,228 | 75,563 |
| The Texas Co. of Mexico S. A. | 62,675 | 66,401 |
| Sinclair Mexican Companies | 104,313 | 204,275 |
| Empire Gas & Fuel Co. | 97,320 | 120,149 |
| Mexican Gulf Oil Co. | 198,611 | ..... |
| Pierce Oil Corp. | 4,486 | ..... |
| Panuco Boston Oil Co. | ..... | 43,321 |
| Totals | 2,394,964 | 1,922,881 |

### Plant Sold For Junk

TULSA, Dec. 26.—The old Milliken Refining Co., property in Arkansas City has been sold to Brown-Strauss Corp. of Kansas City, subject to a merchantable title. The plant probably will be junked completely. The plant has not operated for several years. It has occupied an industrial site of 150 acres.

### *Prices 10 Years Ago*
***Dec. 29, 1919***

| | Oklahoma | Penna. |
|---|---|---|
| 58-60 U. S. Motor..... | 16.00–16.25c | 19.50c |
| 80-84 Natural ..... | 22.75–23.00c | ..... |
| Kerosene (41-43 Okla.; 47 w. w. Pa.) ..... | 10.00–10.25c | 13.50c |
| Fuel Oil (24-26 Okla.; 38-40 Pa.) ..... | $2.50–$2.60 | 10.50–10.75c |
| Crude (Okla. 35-35.9).... | $2.75 | $4.75 |
| Chicago tank wagon ..... | | 21.00c |

### *Prices A Year Ago*
***Dec. 31, 1928***

| | Oklahoma | Penna. |
|---|---|---|
| 58-60 U. S. Motor..... | 8.1167c | 10.25–10.50c |
| Grade A Natural ..... | 7.75–8.00c | ..... |
| Kerosene (Okla. 41-43; Pa., 47 w. w.) ..... | 5.50c | 7.75–8.25c |
| Fuel Oil (Okla. 24-26; Pa. 36-40) ..... | $0.625–$0.675 | 4.75–5.25c |
| Crude (Okla. 35-35.9).... | $1.31 | $3.75 |
| Chicago tank wagon ..... | | 15.00c |

# Mid-Continent Refinery Markets

## Zero Fuel Oils Active; Prices Higher

Staff Special
TULSA, Dec. 28

FUEL oils were exceptionally active in Mid-Continent refinery markets the third week of December. Prices on virtually all grades advanced. A few refiners reported being oversold.

Gas oil was in good demand, with low cold test goods scarce and little straw colored goods of any cold test available for spot shipment. Distillate demand was lighter although colder weather was expected to stimulate buying soon after the first of the year.

Gasolines were quiet with prices covering wider ranges. Cold weather and end of the year dullness combined kept both contract and spot shipments at low ebb. No export buying was reported.

Natural gasolines were inactive and prices lost some ground as manufacturers pushed goods onto the market to clean up their inventories.

Neutral oils and bright stocks were not as active as they had been although prices were unchanged. More goods were available. Wax was quiet with inquiries good for shipment next month.

### Fuel Oils

Large buyers of fuel oil reported that the prevailing prices had opened up two or three new sources of supply. A few refiners, meanwhile, reported being short on fuels. Zero grades continued to be limited and the demand was sufficiently good to cause prices to move higher. One Oklahoma refiner reported selling 50 cars of 24-26 zero grade early in the week at $1.00, while others reported inquiries for January delivery at that price. At the same time inquiries for the ordinary grade, with a cold test above 15 degrees F., were lighter from industrial users and goods moved at a wider price range. The 18-22 and 28-30 zero grades were in excellent demand.

Fuel oil with comparatively low cold test moved readily from north Texas districts at improved prices. Some goods with a cold test around 80 degrees F. were reported offered from this district as low as $0.50 but otherwise prices were firm for all grades.

West Texas 18-22 fuel sold at a wide price range due also to the variance in cold test. Some refiners in that district reported this grade with a cold test, zero to 10, moved readily at $0.70, while other sales of higher cold test goods ranged from $0.60 down with odd sales as low as $0.55 per barrel.

### Gas Oils, Distillates

Zero gas oil was the most active commodity in the market. This grade advanced 0.25 cent with the supply limited to a relatively few refiners. Virtually no straw color grade was available and little differential in price was noted between the dark and straw grades. Some 32-36 dark high cold test gas oil moved at 2.75 cents but the bulk of this grade moved from 2.875 to 3 cents.

The brisk distillate demand that followed the cold snap around the middle of the month eased off. It was reported that the attractive kerosene prices prevailing in some districts had drawn some of the demand. Several refiners who earlier in the week were quoting 4 cents for 38-40 straw distillate announced they were selling some goods later in the week at 3.75 to 3.875 cents.

### Gasoline

The spot gasoline market was extremely quiet during Christmas week. Jobbers were less active due partly to cold weather, and to a desire to keep inventories low.

On December 20 one of the larger Oklahoma refiners reduced his price for 58-60 U. S. Motor to 7 cents. A few cars of this grade were moved direct to the trade at 6.50 cents.

North Texas refiners were busy shipping on recent export orders. The domestic market was reported sluggish.

Gasoline prices were lower in Kansas districts. One refiner lowered his price for 58-60 U. S. Motor to 7.25 cents early in the week with a corresponding reduction for 64-66, 375 and 60-62, 437 e.p. gasolines.

Refiners in Arkansas and Louisiana districts generally reported a fair demand at unchanged prices for their differential territories. Some goods moved on a group 3 basis at lower prices in competition with other districts.

### Natural Gasolines

The demand for natural gasolines was virtually at a standstill throughout the week. Prices lost ground as a surplus of goods accumulated at a few sources. A number of orders were placed for shipment within the next 45 days, at prices understood to have been slightly under the present spot market.

### Kerosene

Demand for kerosene was extremely light and stocks continued to accumulate despite the fact that several refiners have been cutting down on their percentage yields. Exporters were not active.

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BRIGHT STOCK
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NEUTRAL OIL
*Fall:* SCALE WAX
FUEL OIL
*Winter:* KEROSENE

No matter what the season is, we have the oil that goes with it.

Guaranteed 100% PURE PENNSYLVANIA OIL

**SUPERIOR OIL WORKS**
**Warren, Pa.**

## Comparative Prices of 58-60 U. S. Motor Gasoline, 437 E. P., Group 3 and Point of Origin, to Jobbers Only

### In Effect December 30

| | *Price F.O.B. Group 3* | | *Price F.O.B. Point of Origin* | | *If for Particular Destination* |
|---|---|---|---|---|---|
| Oklahoma | ‡6.9500 | (Wt. Avg.) | ‡6.9500 | (Wt. Avg.) | ..... |
| Kansas | 6.50–6.75 | ..... | ..... | ..... | S. O. Neb. & Indiana Territory, etc. |
| Kansas | ..... | ..... | No sales reported | ..... | Kansas only. |
| North Texas | 6.375–6.50 | ..... | 6.25–6.50 | ..... | ..... |
| West Texas | 6.50 | ..... | 6.25–6.50 | ..... | ..... |
| Louisiana-Arkansas | 6.375–6.75 | ..... | ..... | ..... | Michigan, Ohio and Indiana. |
| Louisiana-Arkansas | ..... | ..... | 7.25 | ..... | State or differential haul. |
| Indiana-Illinois | 6.625–7.25 | ..... | .....* | ..... | S. O. Indiana territory except Detroit and vicinity. For Ohio on delivered basis only. |

‡Saturday, Dec. 28, prices.

*Shipments made from E. Chicago, Ind., and Wood River, Ill., according to conditions and freight rates; no prices F.O.B. point of origin can be given.

## Chicago Resale Market

CHICAGO, Dec. 30

ONLY a small volume of spot business was transacted in the Chicago market last week, with zero furnace oils getting the best play. Spot U. S. Motor gasoline prices continued their downward trend with carlot marketers offering goods freely at 6.25 cents for shipment out of Oklahoma, north and west Texas. Resale prices in the Mid-Continent generally were reported at 6 cents and up.

**Following prices represent sales made on group 3 freight basis, although goods generally originate elsewhere.**

| | **Prices Dec. 30** | **Prices Dec. 23** | **Prices Dec. 16** |
|---|---|---|---|
| 58-60 U. S. Motor, 437 e.p. | 6.25 – 7.00 | 6.375– 7.00 | 6.50 – 7.00 |
| 60-62 437 e.p. gasoline | 6.375– 7.00 | 6.50 – 7.00 | 6.625– 7.25 |
| 60-62 400 e.p. gasoline | 6.75 – 7.25 | 7.125– 7.50 | 7.125– 7.50 |
| 64-66 375 e.p. gasoline | 7.75 – 8.00 | 7.75 – 8.00 | 7.875– 8.125 |
| 68-70 350-360 e.p. gasoline | 8.25 – 8.375 | 8.25 – 8.375 | 8.25 – 8.375 |
| 41-43 w.w. kerosene | 4.00 – 4.25 | 4.125– 4.25 | 4.125– 4.375 |
| 42-44 w.w. kerosene | 4.375– 4.75 | 4.50 – 4.75 | ..... |
| 38-40 straw distillate | 3.75 – 4.00 | 3.75 – 4.00 | 3.75 – 4.00 |
| 32-36 ordinary dark gas oil | 2.75 – 3.00 | 2.75 – 3.00 | 2.75 – 3.00 |
| 32-36 dark zero gas oil | 3.25 – 3.375 | 3.25 – 3.375 | 3.125– 3.25 |
| 32-36 straw zero gas oil | †3.375– 3.50 | †3.375– 3.50 | †3.25 – 3.50 |
| 28-30 zero fuel oil | †$1.20 –$1.25 | †$1.175–$1.25 | $1.175–$1.20 |
| 28-30 fuel oil | $1.075–$1.125 | $1.075–$1.125 | $1.05 –$1.10 |
| 24-26 fuel oil | $0.90 –$0.975 | $0.875–$0.925 | $0.85 –$0.90 |
| 18-22 fuel oil, low sulfur | $0.775–$0.85 | $0.75 –$0.80 | $0.70 –$0.75 |
| 18-22 fuel oil, high sulfur zero | †$0.775–$0.85 | $0.75 –$0.80 | $0.70 –$0.75 |

## Weighted Average Prices

### OKLAHOMA

| | ‡Dec. 28 | | Dec. 23 | | Dec. 16 | |
|---|---|---|---|---|---|---|
| | **No. of cars** | **Price** | **No. of cars** | **Price** | **No. of cars** | **Price** |
| 58-60 U. S. Motor, 437 e.p. | 30 | 6.9500 | 42 | 7.1964 | 27 | 7.1204 |
| 60-62 437 e.p. gasoline | No sales reported | | 2 | 7.2500 | No sales | reported |
| 60-62 400 e.p. gasoline | No sales reported | | 3 | 7.5000 | 4 | 7.5625 |
| 64-66 375 e.p. gasoline | 2 | 8.0000 | 1 | 8.0000 | 2 | 8.0000 |

### KANSAS

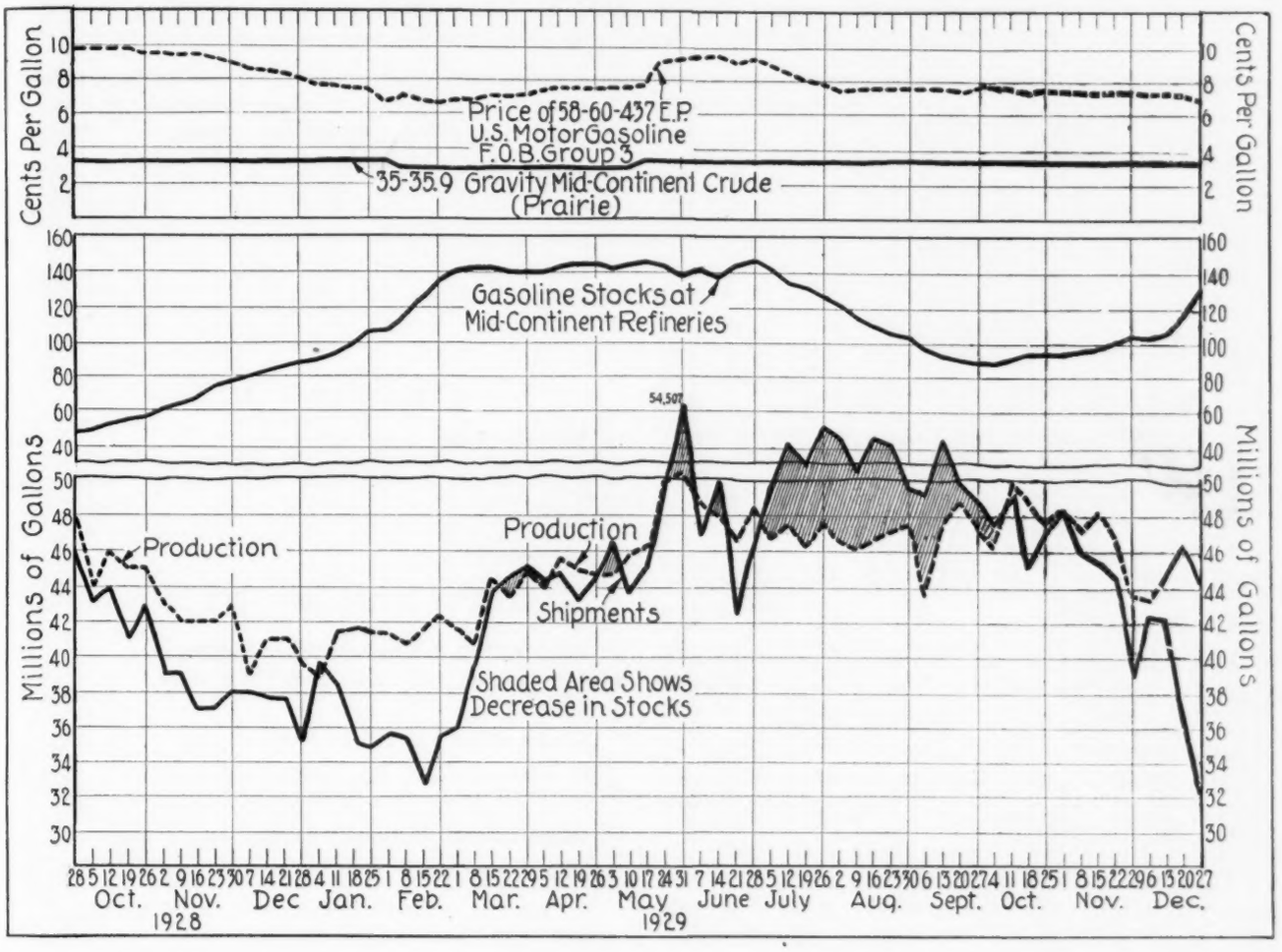
| | ‡Dec. 28 | | Dec. 23 | | Dec. 16 | |
|---|---|---|---|---|---|---|
| | **No. of cars** | **Price** | **No. of cars** | **Price** | **No. of Cars** | **Price** |
| 58-60 U. S. Motor, 437 e.p. | No sales reported | | No sales reported | | No sales reported | |

‡Due to this publication going to press one day earlier on account of the New Year holiday, no weighted average prices as of Monday, Dec. 30, were available for this issue. Above are Saturday, Dec. 28, weighted averages. They will be corrected in the issue of Jan. 8 to reflect Monday's prices.

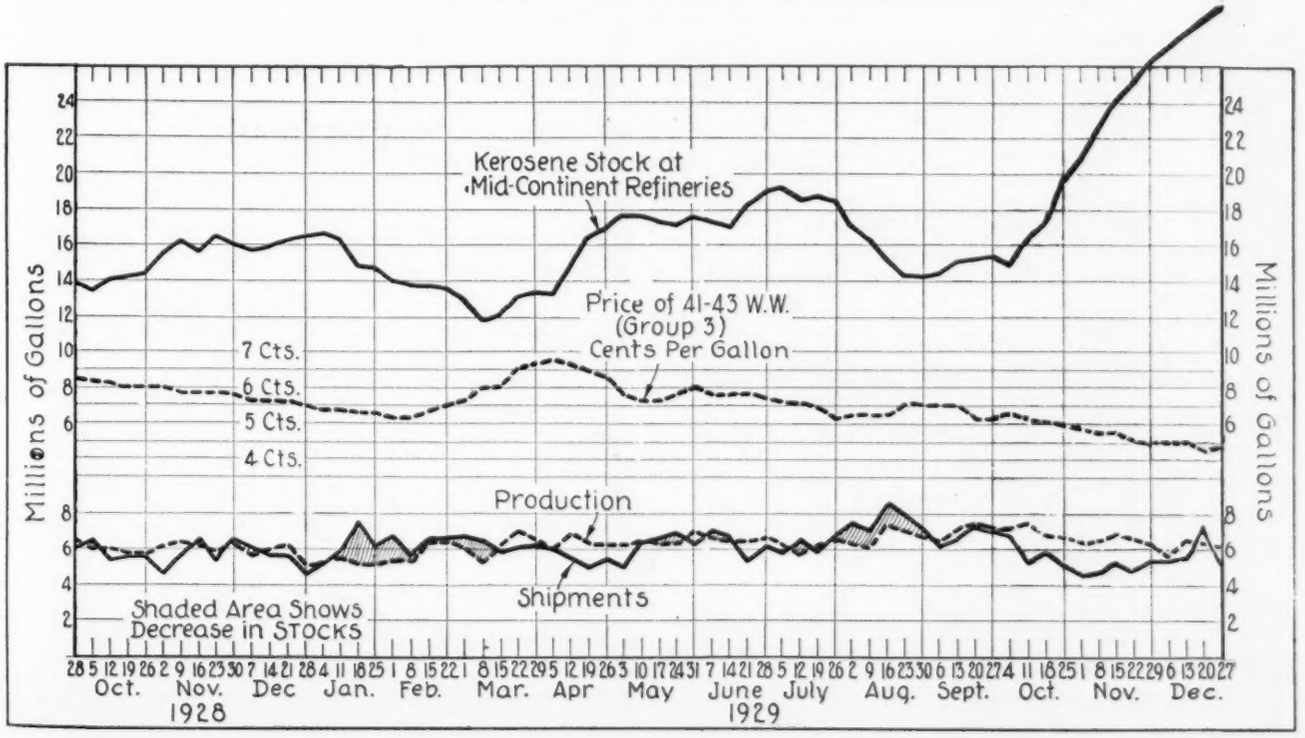
**†Prices nominal**

# Barometer of Mid-Continent Refinery Market—Week Ending December 27

*Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 93 Plants to National Petroleum News*


Cents Per Gallon
Price of 58-60-437 E.P. U.S. Motor Gasoline F.O.B. Group 3
35-35.9 Gravity Mid-Continent Crude (Prairie)
Gasoline Stocks at Mid-Continent Refineries
54,507
Millions of Gallons
Production
Shipments
Shaded Area Shows Decrease in Stocks
Oct. Nov. Dec Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1928
1929

*Prices shown above are extended to date shown in Refinery Market and Crude tables in Market section of this issue and stocks, shipments and Production are extended to date as shown in the table on page 74*



# Refinery Markets on Light Oils and Lubricants

Prices given below are in cents per gallon, F. O. B. refinery except where $ is shown

*(These Refinery Prices compiled in the OIL PRICE HANDBOOK for a whole year)*

## GASOLINE AND NAPHTHA

| OKLAHOMA | Prices Dec. 30 | Prices Dec. 23 | Prices Dec. 16 |
|---|---|---|---|
| 48-50 450 e.p. naphtha... | 6.50 – 7.00 | 6.75 – 7.00 | 6.625– 7.00 |
| 50-52 450 e.p. naphtha... | 6.50 – 7.00 | 6.75 – 7.00 | 6.625– 7.00 |
| 56-58 450 e.p. gasoline... | 6.25 – 6.50 | 6.375– 6.75 | 6.50 – 6.75 |
| 58-60 450 e.p. gasoline... | 6.25 – 6.50 | 6.50 – 6.75 | 6.50 – 6.75 |
| 64-66 390 e.p. gasoline... | 7.375– 7.625 | 7.50 – 7.625 | 7.50 – 7.625 |
| 68-70 350-360 e.p. gasoline | 8.125– 8.25 | 8.125– 8.25 | 8.25 |
| **PENNSYLVANIA** | | | |
| 52-54 Naphtha..... | 7.25 – 8.00 | 7.25 – 8.00 | 7.25 – 8.00 |
| 54-56 Naphtha..... | 7.25 – 8.25 | 7.25 – 8.25 | 7.25 – 8.25 |
| 58-60 U.S. Motor 437 e.p. | 7.75 – 8.75 | 7.875– 8.75 | 8.00 – 9.00 |
| 60-62 400-410 e.p. gasoline | 8.25 – 8.75 | 8.25 – 9.00 | 8.375– 9.00 |
| 64-66 390 e.p. gasoline.... | 8.50 – 9.00 | 8.50 – 9.50 | 8.50 – 9.50 |
| 68-70 350-360 e.p..... | 9.50 –10.25 | 9.50 –10.50 | 9.50 –10.50 |
| **OHIO (Quotations of S. O. Ohio. 4c state tax to be added.)** | | | |
| **U. S. Motor Gasoline** | | | |
| Ohio, delivery at any point..... | 9.50 | 9.50 | 9.50 |
| **KANSAS (F. O. B. refinery Kansas destination)** | | | |
| 60-62 400 e.p. gasoline... | 7.25 – 7.75 | 7.50 – 7.75 | 7.50 – 7.75 |
| 64-66 375 e.p. gasoline... | 7.625– 8.00 | 7.75 – 8.25 | 7.75 – 8.25 |
| **NORTH TEXAS** | | | |
| 56-58 450 e.p. gasoline... | 6.25 | 6.25 – 6.625 | 6.375– 6.625 |
| 58-60 450 e.p. gasoline... | 6.25 | 6.25 – 6.625 | 6.375– 6.625 |
| 58-60 U.S. Motor 437 e.p. | 6.25 – 6.50 | 6.375– 6.625 | 6.50 – 6.75 |
| 60-62 400 e.p. gasoline... | 6.875– 7.00 | 6.875– 7.125 | 6.875– 7.25 |
| 64-66 390 e.p. gasoline... | 7.375– 7.50 | 7.50 – 7.625 | 7.50 |
| 64-66 375 e.p. gasoline... | 7.75 | 7.75 – 7.875 | 7.75 |
| 68-70 350-360 e.p. gasoline | 8.125– 8.375 | 8.125– 8.375 | 8.00 – 8.25 |
| ****WEST TEXAS (F.o.b. West Texas refinery, for unrestricted shipment)** | | | |
| 50-52 naphtha..... | 5.75 | 5.75 | 5.75 – 6.00 |
| 58-60 437 e.p. gasoline... | 6.125– 6.375 | 6.25 – 6.375 | 6.25 – 6.50 |
| 58-60 U.S. Motor 437 e.p. gasoline..... | 6.25 – 6.50 | 6.375– 6.625 | 6.50 – 6.75 |
| **NORTH LOUISIANA (N. La., Ark. and Miss. destination)** | | | |
| 58-60 U.S. Motor gasoline | 7.25 | 7.25 | 7.25 |
| **ARKANSAS (Ark., N. La. and Miss. destination)** | | | |
| 58-60 U.S. Motor 437 e.p. | 7.25 | 7.25 | 7.25 |
| **CALIFORNIA (3c tax to be added to California gasoline prices if used in state.)** | | | |
| 54-58 U.S. Motor 437 e.p. | ‡9.50 –10.50 | ‡9.50 –10.50 | ‡9.50 –10.50 |
| 58-61 375-400 e.p. gasoline | 10.50 –11.50 | 10.50 –11.00 | 10.50 –11.50 |
| 42-45 Engine Distillate 445-480 e.p..... | 7.50 – 8.00 | 7.50 – 8.00 | 7.50 – 8.00 |

‡For outside state shipment price was 7.25–8.25c on Oct. 21, 7.00–8.00c on Oct. 28 and Nov. 4. 6.50–7.25c on Nov. 11, 18 and 25. 7.00–7.75c on Dec. 2, 9, 16, 23, and 30.

## NATURAL GASOLINE

(Note: End point of all grades, not over 375 F. Corrosion test adopted Oct. 1, 1927; A.S.T.M. Method D130-27T; doctor test, July 2, 1928.)

| OKLAHOMA | | | |
|---|---|---|---|
| Grade AA, 80-87.9, 90% Recovery..... | ‡6.00 | 6.25 | 6.375 |
| Grade A, 72-79.9, 90% Recovery..... | ‡6.125– 6.25 | 6.50 – 6.625 | 6.625 |
| Grade BB, 84-92, 85% Recovery..... | ‡5.375– 5.50 | 5.50 – 5.625 | 5.75 – 5.875 |
| Grade B, 76-83.9, 85% Recovery..... | ‡5.625– 5.75 | 6.00 – 6.125 | 5.75 – 5.875 |
| Grade C, 80-92, 78% Recovery..... | ‡5.375– 5.50 | 5.50 – 5.625 | 5.75 |

‡Saturday, Dec. 28 prices.

| NORTH TEXAS (F. o. b. Breckenridge) | | | |
|---|---|---|---|
| Grade AA, 80-87.9, 90% Recovery..... | ‡6.00 | 6.25 | 6.375 |
| Grade A, 72-79.9, 90% Recovery..... | ‡6.125– 6.25 | 6.50 – 6.625 | 6.625 |
| Grade BB, 84-92, 85% Recovery..... | ‡5.375– 5.50 | 5.625 | 5.75 – 5.875 |
| Grade B, 76-83.9, 85% Recovery..... | ‡5.625– 5.75 | 6.00 – 6.125 | 5.75 – 5.875 |
| Grade C, 80-92, 78% Recovery..... | ‡5.375– 5.50 | 5.625 | 5.75 |

‡Saturday, Dec. 28 prices.

†Prices nominal ††Only one refiner quoting *Quotations only

| NORTH LOUISIANA (F. o. b. Monroe District) | Prices Dec. 30 | Prices Dec. 23 | Prices Dec. 16 |
|---|---|---|---|
| Grade AA..... | ††6.25 | †6.50 | †6.75 |
| Grade BB..... | ††5.75 | †6.00 | †6.25 |
| Grade C..... | ††5.75 | †6.00 | †6.25 |

‡Saturday, Dec. 28 prices

| CALIFORNIA | | | |
|---|---|---|---|
| 75-85, 375-390 e.p. blend | 8.00 – 9.00 | 8.50 – 9.00 | 8.50 – 8.75 |

## BURNING OILS

| PENNSYLVANIA | | | |
|---|---|---|---|
| 45 w.w. kerosene..... | 6.00 – 6.25 | 6.00 – 6.25 | 6.125– 6.50 |
| 46 w.w. kerosene..... | 6.25 – 6.50 | 6.25 – 6.50 | 6.50 – 6.75 |
| 47 w.w. kerosene..... | 6.50 – 6.75 | 6.50 – 7.00 | 6.75 – 7.25 |
| 300 mineral seal..... | 7.00 – 7.50 | 7.00 – 7.50 | 7.00 – 7.75 |
| **OKLAHOMA** | | | |
| 41-43 w.w. kerosene..... | 4.125– 4.50 | 4.125– 4.50 | 4.25 – 4.75 |
| 42-44 w.w. kerosene..... | 4.375– 5.00 | 4.375– 5.00 | 4.50 – 5.00 |
| **KANSAS ( F. O. B. refinery Kansas destination)** | | | |
| 41-43 w.w. kerosene..... | 4.50 – 5.00 | 4.50 – 5.00 | 4.75 – 5.00 |
| 42-44 w.w. kerosene..... | 4.75 – 5.25 | 5.00 – 5.25 | 5.00 – 5.25 |
| **NORTH TEXAS** | | | |
| 40-42 w.w. kerosene..... | 4.00 | 4.00 – 4.125 | 4.00 |
| 41-43 w.w. kerosene..... | 4.00 – 4.25 | 4.125– 4.25 | 4.00 – 4.25 |
| **NORTH LOUISIANA (N. La., Ark. and Miss. destination)** | | | |
| 41-43 w.w. kerosene..... | 5.25 | 5.25 | 5.00 – 5.25 |
| 42-44 w.w. kerosene..... | 5.50 | 5.50 | 5.25 – 5.50 |
| **ARKANSAS (Ark., N. La. and Miss. destination)** | | | |
| 42-44 w.w. kerosene..... | 5.50 | 5.50 | 5.50 |
| **CALIFORNIA** | | | |
| 38-40 w.w. kerosene..... | 5.50 – 6.00 | 5.50 – 6.00 | 5.50 – 6.00 |

## NEUTRAL OIL

| PENNSYLVANIA | | | |
|---|---|---|---|
| Vis. | | (Viscosity at 70°F.) | |
| 200 No. 3 Assoc. Filt..... | 24.50 –27.00 | 24.50 –27.00 | 24.50 –27.00 |
| 180 No. 3 Assoc. Filt..... | 19.50 –23.00 | 19.50 –23.00 | 19.50 –23.00 |
| 150 No. 3 Assoc. Filt..... | 15.25 –18.00 | 15.25 –18.00 | 15.50 –18.00 |
| | | (Non Viscous) | |
| 34 Grav. 330-340 Flash.. | 7.00 – 7.50 | 7.00 – 7.50 | 7.00 – 7.50 |

| ****OKLAHOMA** | | | |
|---|---|---|---|
| Vis. Color | | (Viscosity at 100°F.) | |
| 100—No. 2..... | 6.00 – 7.50 | 6.00 – 7.50 | 6.00 – 7.50 |
| 150—No. 3..... | 7.50 – 8.50 | 7.50 – 8.50 | 7.50 – 8.50 |
| 150—No. 4..... | 6.75 – 8.00 | 6.75 – 8.00 | 6.75 – 8.00 |
| 180—No. 3..... | 9.00 –10.00 | 9.00 –10.00 | 9.00 –10.00 |
| 180—No. 4..... | 8.75 – 9.50 | 8.75 – 9.50 | 8.75 – 9.50 |
| 180—No. 5..... | 8.50 – 9.00 | 8.50 – 9.00 | 8.50 – 9.00 |
| 200—No. 3..... | 10.50 –12.00 | 10.50 –12.00 | 10.00 –12.00 |
| 200—No. 4..... | 10.00 –11.00 | 10.00 –11.00 | 9.00 –11.00 |
| 200—No. 5..... | 9.50 –11.00 | 9.50 –11.00 | 9.50 –11.00 |
| 220—No. 3..... | 12.50 –13.50 | 12.50 –13.50 | 12.50 –13.50 |
| 220—No. 4..... | 12.00 –12.50 | 12.00 –12.50 | 12.00 –12.50 |
| 220—No. 5..... | 11.00 –12.00 | 11.00 –12.00 | 11.00 –12.00 |
| 240—No. 3..... | 13.00 –16.00 | 13.00 –16.00 | 13.00 –16.00 |
| 240—No. 4..... | 12.00 –13.75 | 12.00 –13.75 | 12.00 –13.75 |
| 240—No. 5..... | 11.00 –13.00 | 11.00 –13.00 | 11.00 –13.00 |
| 280—No. 3..... | 16.00 –17.00 | 16.00 –17.00 | 15.50 –17.00 |
| 280—No. 4..... | 14.00 –16.00 | 14.00 –16.00 | 14.00 –17.00 |
| 280—No. 5..... | 13.25 –15.00 | 13.00 –15.00 | 12.75 –14.75 |

****Represents Both Sales and Quotations.**

# Refinery Markets Wax, Lubricants, Heavy Oil

**Prices given below are in cents per gallon, F. O. B. refinery except where $ is shown**

***(For quick reference to Refinery Prices, get the OIL PRICE HANDBOOK, published annually)***

### GULF COASTAL

| Vis. Color | Prices Dec. 30 | Prices Dec. 23 | Prices Dec. 16 |
|---|---|---|---|
| | (Viscosity at 100°F., pour test 0) | | |
| 100—No. 2 Pale | 6.00 – 7.00 | 6.00 – 7.00 | 6.00 – 7.00 |
| 200—No. 3 Pale | 9.00 – 9.50 | 9.00 – 9.50 | 9.00 – 9.50 |
| 300—No. 3 Pale | 9.75 –10.25 | 10.00 –10.75 | 10.00 –10.75 |
| 500—No. 3½ Pale | 11.00 –11.50 | 11.50 –12.00 | 11.50 –12.00 |
| 750—No. 4 Pale | 12.50 –13.00 | 12.50 –13.00 | 12.50 –13.00 |
| 200—No. 5½ Red Oil | 7.75 – 8.25 | 8.00 – 8.75 | 8.00 – 8.75 |
| 300—No. 5½ Red Oil | 8.75 – 9.25 | 9.00 –10.00 | 9.00 –10.00 |
| 500—No. 6 Red Oil | 9.50 –10.00 | 9.50 –10.00 | 9.50 –10.00 |
| 750—No. 6 Red Oil | 11.50 –12.00 | 11.50 –12.00 | 11.50 –12.00 |

### CALIFORNIA

| Vis. Color | | | |
|---|---|---|---|
| | (Viscosity at 100°F.) | | |
| 100—No. 3 | 9.50 –10.00 | 9.50 –10.00 | 9.50 –10.00 |
| 200—No. 3 | 11.50 | 11.50 | 11.50 |
| 300—No. 3 | 13.00 | 13.00 | 13.00 |
| 450—No. 3 | 15.50 | 15.50 | 15.50 |
| 550—No. 3 | 16.50 | 16.50 | 16.50 |
| 600—No. 3 | 17.00 | 17.00 | 17.00 |
| 200—No. 5 | 11.00 | 11.00 | 11.00 |
| 300—No. 5 | 12.00 | 12.00 | 12.00 |
| 400—No. 5 | 14.00 | 14.00 | 14.00 |
| 500—No. 5 | 15.00 | 15.00 | 15.00 |
| 600—No. 5 | 16.00 | 16.00 | 16.00 |
| 700—No. 7 | 18.00 | 18.00 | 18.00 |

## CYLINDER STOCKS

### **OKLAHOMA

| | | | |
|---|---|---|---|
| †190-200 Vis. D at 210° Brt. St. | 39.00 –42.00 | 41.00 –42.00 | 42.00 |
| †150-160 Vis. D at 210° Brt. St. | 37.00 | 37.00 | 37.00 |
| †150-160 Vis. E 210° Brt. St. | 35.00 –36.00 | 35.00 –36.00 | 35.00 –36.00 |
| †600 St. Ref. Olive Green | 9.00 –10.00 | 9.00 –10.00 | 9.00 –15.00 |
| †600 St. Ref. Dark Green | 9.00 | 9.00 | 9.00 –11.00 |
| Black Oil | 5.00 | 5.00 | 5.00 |

### PENNSYLVANIA (A. S. T. M. Tests)

| | | | |
|---|---|---|---|
| †600 Steam Refined, filterable | 24.00 –25.00 | 25.00 –26.00 | 25.00 –26.00 |
| †650 Steam Refined | 29.50 –31.00 | 29.50 –31.00 | 30.00 –31.00 |
| †600 Flash | 32.00 –33.00 | 32.00 –33.00 | 32.50 –34.50 |
| †625 Flash | 36.00 –36.50 | 36.00 –36.50 | 36.00 –37.00 |
| 600 Warren E | 32.00 –32.50 | 32.00 –32.50 | 32.00 –32.50 |
| †600 Oil City E | 30.50 –31.00 | 30.50 –31.00 | 30.50 –32.00 |
| †600 D Filtered | 36.00 –37.00 | 36.00 –37.00 | 36.00 –37.00 |
| Cold Test Stock, 40-50 p. p., 140-150 vis. at 210° 540-550 flash, No. 8 color | 44.00 –46.00 | 45.00 –47.00 | 45.00 –47.00 |
| 40-50 p.p., 140-150 vis. at 210° 540-550 flash, No. 6-6½ color diluted | 42.00 –44.00 | 42.50 –44.00 | 43.00 –45.00 |

## WAX

### PENNSYLVANIA (Per pound, New York)

| | | | |
|---|---|---|---|
| †122-124 white crude scale, a.m.p. | 3.00 – 3.125 | 3.125 | 3.00 – 3.125 |
| †124-126 white crude scale, a.m.p. | 3.125 | 3.125 | 3.00 – 3.125 |

### **OKLAHOMA

| | | | |
|---|---|---|---|
| †124-126 White Crude Scale, a. m. p. | 3.00 | 3.00 | 3.00 |

### CALIFORNIA

| | | | |
|---|---|---|---|
| †White crude scale, per pound, ton lots, a.m.p. | 6.00 – 6.50 | 6.00 – 6.50 | 6.00 – 6.50 |

## DISTILLATE, GAS AND FUEL OIL

### PENNSYLVANIA (For outside Pittsburgh district)

| | | | |
|---|---|---|---|
| 36-40 fuel oil | 4.625– 5.00 | 4.625– 5.00 | 4.50 – 5.00 |
| 30-34 fuel oil | 4.625– 4.875 | 4.625– 4.875 | 4.50 – 4.75 |
| 28-32 fuel oil | 4.625– 4.875 | 4.625– 4.875 | 4.50 – 4.75 |

**†Prices nominal ††Only one refiner quoting *Quotations only**

### OKLAHOMA

| | Prices Dec. 30 | Prices Dec. 23 | Prices Dec. 16 |
|---|---|---|---|
| 38-40 straw distillate | 3.625– 3.875 | 3.75 – 3.875 | 3.75 |
| 36-38 straw distillate | 3.50 – 3.75 | 3.75 | 3.625– 3.75 |
| 32-36 straw gas oil | 3.00 – 3.125 | 3.00 – 3.25 | 3.00 – 3.25 |
| 32-36 straw gas oil zero | 3.50 | 3.375– 3.50 | 3.375– 3.50 |
| 32-36 dark gas oil | 2.875– 3.00 | 2.875– 3.00 | 2.875– 3.125 |
| 32-36 dark gas oil zero | 3.375 | 3.375– 3.50 | 3.25 – 3.375 |
| 28-30 zero fuel oil | $1.20 – 1.25 | †$1.20 – 1.25 | †$1.20 – 1.25 |
| 28-30 fuel oil (in bbls.) | $1.05 – 1.15 | $1.10 – 1.15 | $1.10 – 1.175 |
| 26-28 fuel oil (in bbls.) | $1.00 – 1.05 | $0.975– 1.05 | $0.975– 1.05 |
| 24-26 fuel oil (in bbls.) | $0.95 – 1.00 | $0.95 – 1.00 | †$0.95 – 1.00 |
| 22-26 fuel oil (in bbls.) | $0.90 –$1.00 | $0.90 – 0.95 | $0.85 – 0.90 |
| 18-22 fuel oil (in bbls.) | $0.80 – 0.85 | $0.75 – 0.80 | $0.75 – 0.80 |
| 16-20 fuel oil (in bbls.) | $0.75 – 0.85 | $0.70 – 0.80 | $0.65 – 0.80 |
| 14-16 fuel oil (in bbls.) | $0.70 – 0.85 | $0.70 – 0.80 | $0.65 – 0.80 |

### KANSAS (F. O. B. refinery Kansas destination)

| | | | |
|---|---|---|---|
| 38-40 straw distillate | 3.875– 4.125 | 4.00 – 4.25 | 4.00 – 4.25 |
| 36-38 straw distillate | 3.875 | 3.875– 4.00 | 3.875– 4.00 |
| 32-36 straw gas oil | 3.50 | 3.375– 3.50 | 3.375– 3.50 |
| 18-22 fuel oil | $0.85 – 0.90 | $0.825– 0.90 | $0.825– 0.90 |
| 10-14 fuel oil | $0.775– 0.85 | $0.75 – 0.85 | $0.75 – 0.825 |

### NORTH TEXAS

| | | | |
|---|---|---|---|
| 38-40 straw distillate | 3.50 – 3.75 | 3.625– 3.75 | 3.50 – 3.75 |
| 38-40 p.w. treated distillate | 3.625– 3.75 | 3.75 – 3.875 | 3.75 – 3.875 |
| 32-36 gas oil, cracked | 3.00 – 3.25 | 3.00 – 3.25 | 2.75 – 3.125 |
| 32-36 St. reduced gas oil | 2.50 – 2.625 | 2.50 – 2.75 | 2.50 – 2.75 |
| 24-26 fuel oil (in bbls.) | $0.75 – 0.80 | $0.75 –$0.80 | $0.75 |
| 20-24 fuel oil | $0.65 – 0.70 | $0.625– 0.70 | $0.625– 0.70 |
| 18-22 fuel oil | $0.65 | $0.65 | $0.65 |

### **WEST TEXAS (F. o. b. West Texas refinery, for unrestricted shipment)

| | | | |
|---|---|---|---|
| 34-38 gas oil | 2.625– 2.75 | 2.625– 2.75 | 2.50 – 2.75 |
| 30-32 gas oil | 2.375– 2.75 | 2.50 – 2.75 | 2.50 – 2.75 |
| 28-30 zero gas oil | 3.00 – 3.25 | 3.00 – 3.125 | 3.00 – 3.125 |
| 18-22 fuel oil | $0.60 – 0.70 | $0.60 – 0.70 | $0.60 – 0.70 |

### NORTH LOUISIANA (N. La., Ark. and Miss. destination)

| | | | |
|---|---|---|---|
| 32-36 gas oil, dark | 3.50 | 3.50 | 3.50 |
| 32-36 gas oil, straw | 3.50 | 3.50 | 3.50 |
| 14-16 fuel oil (in bbls.) | $0.775– 0.85 | $0.75 – 0.85 | $0.75 – 0.85 |

### ARKANSAS (Ark., N. La. and Miss. destination)

| | | | |
|---|---|---|---|
| 32-36 gas oil, straw | 3.50 | 3.50 | 3.50 |
| 32-36 dark gas oil | 3.50 | 3.50 | 3.50 |
| 28-30 gas oil | 3.25 | 3.25 | 3.25 |
| 20-24 fuel oil | $0.95 | $0.95 | ..... |
| ‡9-12 fuel oil | $0.70 | $0.70 | $0.75 – 0.85 |
| Black oil | 3.25 | 3.25 | ..... |

‡Gravity changed from 14-16 fuel oil to 9-12 fuel oil Dec. 23.

### CALIFORNIA (F. o. b. San Joaquin Valley. At San Francisco 4c per bbl. more)

| | | | |
|---|---|---|---|
| 14-18 fuel oil (per bbl.) | $0.45 –$0.60 | $0.45 –$0.60 | $0.40 –$0.60 |
| 14-18 Bunker oil (per bbl.) | $0.60 –$0.75 | $0.65 –$0.75 | $0.70 –$0.75 |
| 30-34 gas oil (per bbl.) | $0.80 –$0.90 | $0.80 –$0.90 | $0.80 –$0.90 |
| 27 Plus Diesel oil (per bbl.) | $0.80 –$0.90 | $0.80 –$0.90 | $0.80 –$0.90 |

## PETROLATUMS

**PENNSYLVANIA** (In barrels, carload lots, f. o. b. refinery. In tank cars ½c to ¾c per pound less.) Two refiners quoting.

| | | | |
|---|---|---|---|
| Snow White | 8.75 – 9.00 | 8.75 – 9.00 | 8.75 – 9.00 |
| Lily White | 7.75 – 8.00 | 7.75 – 8.00 | 7.75 – 8.00 |
| Cream White | 6.75 – 7.00 | 6.75 – 7.00 | 6.75 – 7.00 |
| Light Amber | 3.75 | 3.75 | 3.75 |
| Amber | 3.50 | 3.50 | 3.50 |
| Red | 3.25 | 3.25 | 3.25 |

## PETROLEUM COKE

### **OKLAHOMA

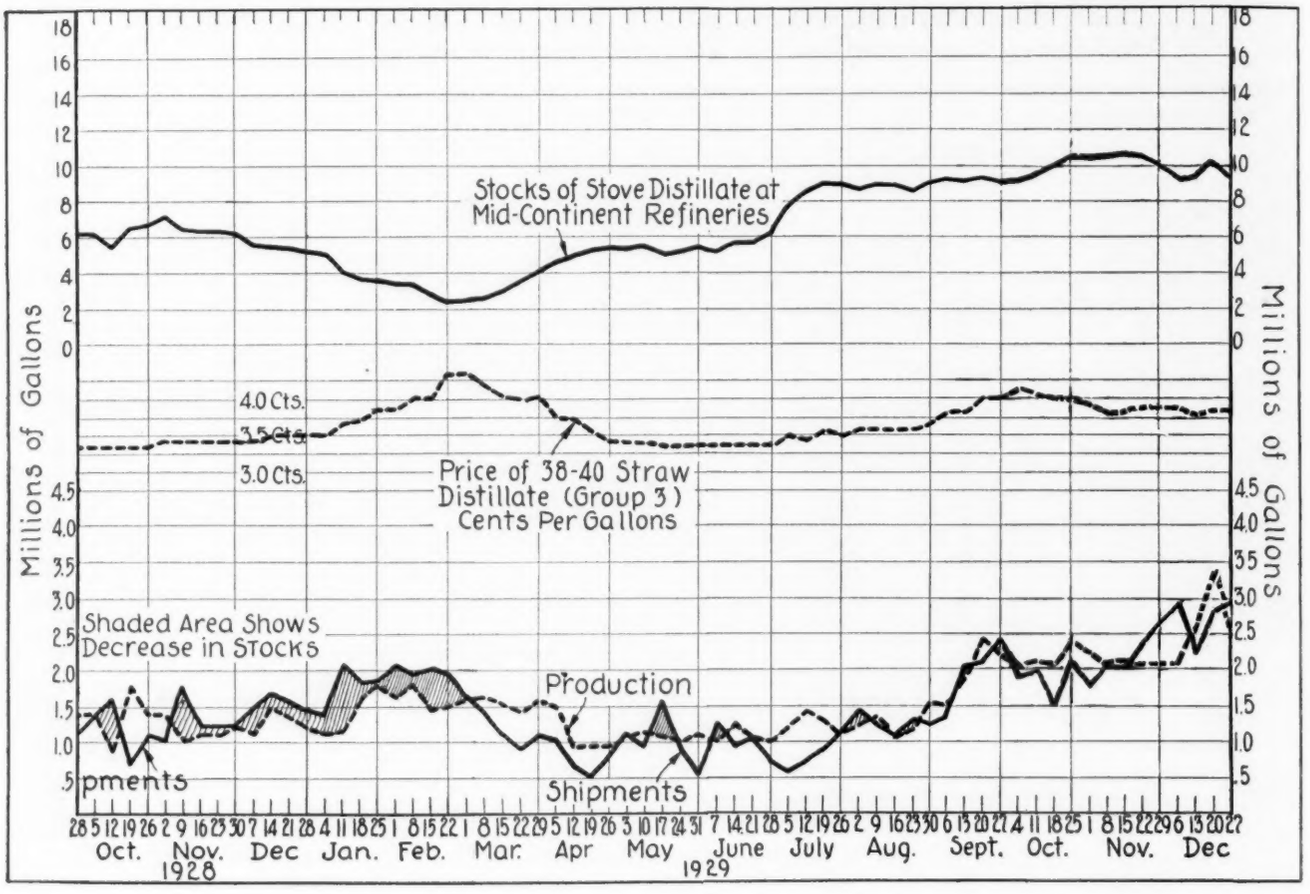
(Per ton in car lots)

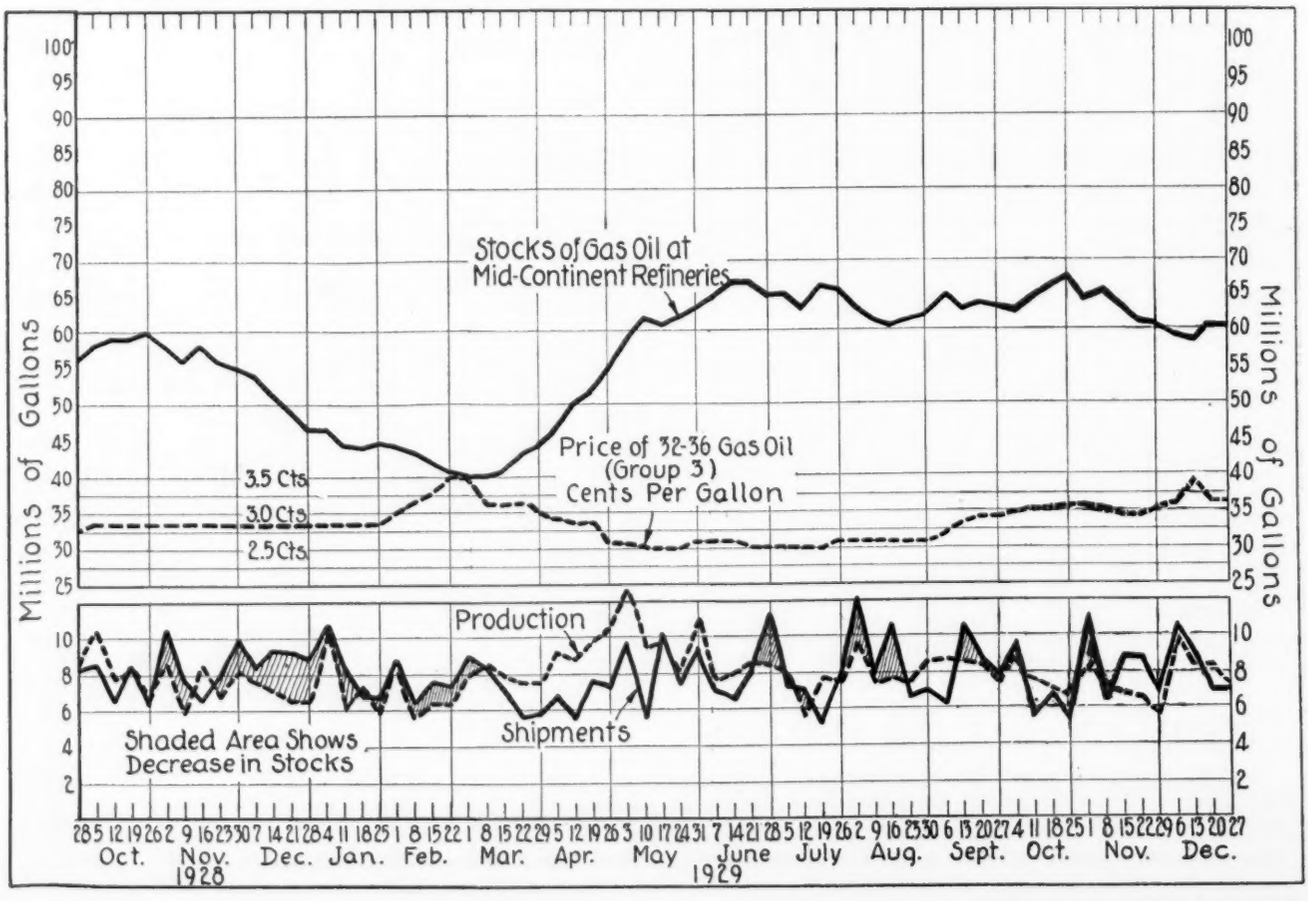
| | | | |
|---|---|---|---|
| Lump | $4.50 – 5.00 | $4.50 – 5.00 | $4.50 – 5.00 |
| Still run | $3.00 | $3.00 | $3.00 |
| Breeze | $2.00 | $2.00 | $2.00 |

**Represents Both Sales and Quotations.

# Barometer of Mid-Continent Refinery Market—Week Ending December 27

***Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 93 Plants to National Petroleum News***


Millions of Gallons
Millions of Gallons
Stocks of Stove Distillate at Mid-Continent Refineries
4.0 Cts.
3.5 Cts.
3.0 Cts.
Price of 38-40 Straw Distillate (Group 3) Cents Per Gallons
Shaded Area Shows Decrease in Stocks
Production
Shipments
Oct. Nov. Dec Jan. Feb. Mar. Apr May June July Aug. Sept. Oct. Nov. Dec
1928
1929


Millions of Gallons
Millions of Gallons
Stocks of Gas Oil at Mid-Continent Refineries
3.5 Cts.
3.0 Cts.
2.5 Cts.
Price of 32-36 Gas Oil (Group 3) Cents Per Gallon
Production
Shipments
Shaded Area Shows Decrease in Stocks
Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1928
1929

# You're being ROBBED— And here's the thief!

ANY names you could call the stick that measures the gasoline in your tanks wouldn't be half bad enough! He's a liar and a robber. He swindles you out of profits enough every month to make a noticeable dent on your balance sheet!

Why *shouldn't* sticks be chronic liars? They warp, go in slantwise, hit rivets or projections. They never tell the truth about sloping tanks. They can't check deliveries, they can't take inventories with any degree of accuracy; gasoline creeps up the stick; agitated tank contents give false readings. *Modern* service stations have delightedly chucked the stick in the discard as an ancient relic.

And in their places you find Liquidometers—precise, accurate, instantly-read gauges which tell the whole truth about tank content. One large oil company after another has installed them in all of their service stations on the basis of *proved* savings. They provide hour by hour inventories of stock; they account for every gallon of gas sold; they show up unsuspected leaks. And they quickly expose any petty dishonesty wherever it exists.

Follow the lead of the most progressive oil companies. Just mail the coupon and get the facts!

The Liquidometer Corp.
Long Island City, N. Y.

Please send me full information about the Liquidometer.

*Name* _____

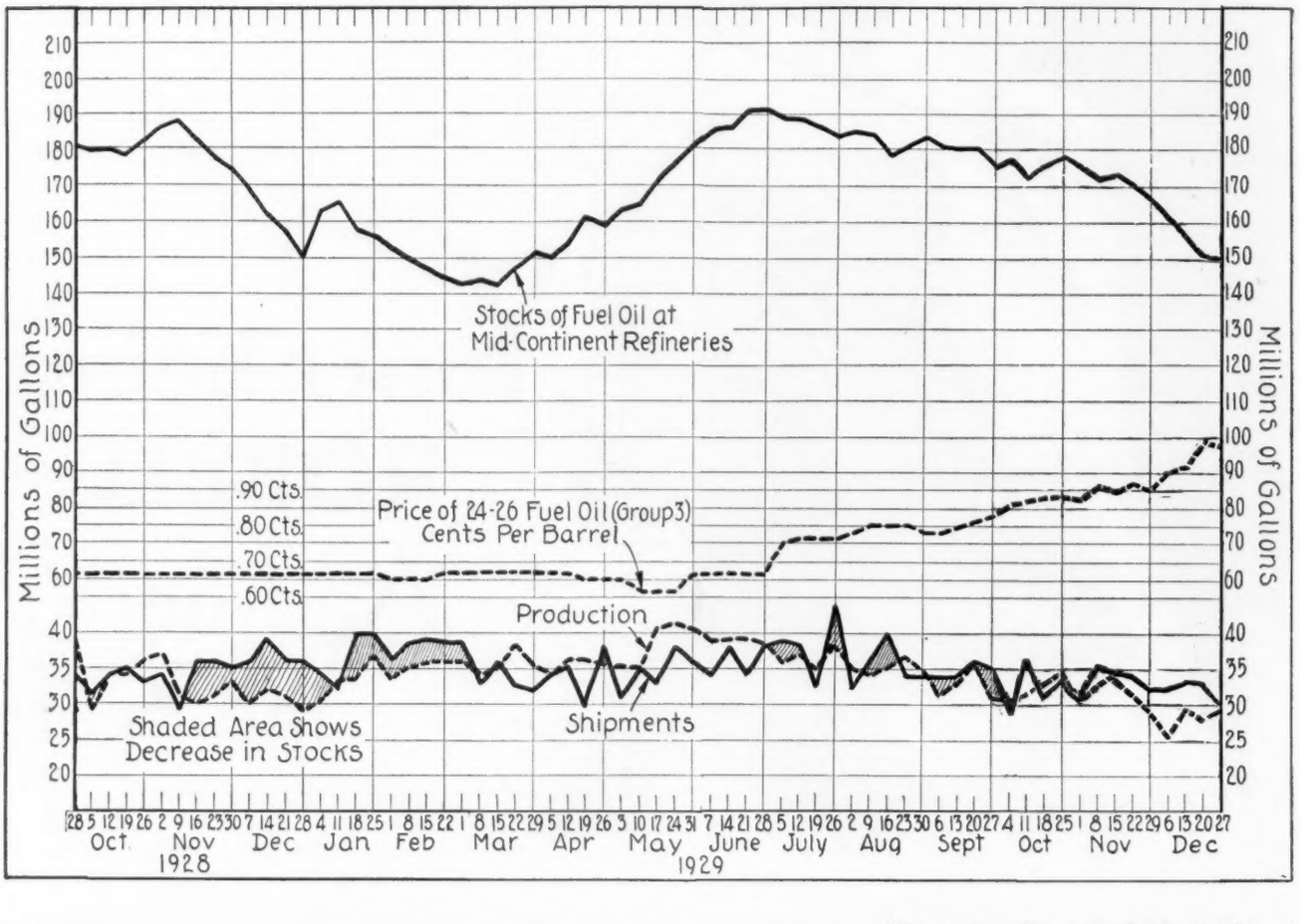
*Address* _____

_____

N. P.-1-30

## Barometer of Mid-Continent Refinery Market—Week Ending December 27

*Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 93 Plants to National Petroleum News*




# California Refinery Market

## Eastern Buyers Bid 6 Cents for Gasoline

LOS ANGELES, Dec. 26

CALIFORNIA refiners were busily engaged making out their 1930 schedules and closing a few remaining contracts for export gasoline the past week.

One or two eastern buyers were still reported to be in the market on the Pacific Coast for cargoes of gasoline with offers of 6 cents and less. It was thought likely that one of the independent companies would relieve crowed storage facilities by unloading a cargo of U. S. Motor at these low prices.

Marketers in the refinery tank car market were growing anxious over the increase of gasoline in storage and the amount of "bootleg" motor fuel that is flooding the local area of distribution.

Out of state gasoline moved to jobbers in Montana and Utah in some instances as low as 6.50 cents during the past week, although quotations for this class of shipments ranged from 7 to 7.75 cents. Regular sources of supply, which formerly had made no attempt to meet cut prices, went after the business wholeheartedly the past week.

Motor fuel for shipment within the state moved at a wide range of prices, according to quotations received from various refineries. Where jobbers could guarantee that the gasoline would not be sold at cut prices, that is, prices under the standard maintained by stations selling major company products which in Los Angeles and immediate vicinity is 19.50 cents. It sold at from 8.50 to 9.50 cents with quotations ranging from 9.50 to 10.50 cents. These prices do not include the state tax of 3 cents.

With the increased use of natural gasoline in blending quotations for this commodity remained steady at from 8 to 9 cents for spot business with contracts being closed at from 7.50 to 8 cents per gallon. The larger part of the spot business was done at about 8.50 cents.

Fuel oils moved up out of the cellar position they have occupied for the past few months with several large orders being placed at $0.50 per barrel. Steady demand is expected to fasten the price on this goods at its present level and it is hoped that this figure may be bettered during the coming months.

Kerosene moved to out of state points for as low as 5 cents per gallon although instate quotations remained at 5.50 to 6 cents.

Other petroleum products showed no change over the previous week.

---

CHICAGO, Dec. 28.—Geo. D. Locke, vice-president of the Barnsdall Refineries, Inc., and Mrs. Locke left the 26th for a three months' trip in South America. Mr. Locke expects to be back in this country for the Western Petroleum Refiners Association meeting in Shreveport, March 10 to 12.

## Pennsylvania Market

### Large Orders for Kerosene Placed

CLEVELAND, Dec. 28.—Trading of practically all commodities was at a standstill in the western Pennsylvania refinery market during Christmas week. Kerosene was a notable exception to this rule. Price changes throughout the list of refinery products were few; such as were noted were recessions rather than advances.

Several large orders for kerosene continued to hang over the market but buyers' ideas of prices in most instances failed to prove attractive to sellers. One large buyer in particular was seeking 50 cars of 45 water white kerosene for shipment over January and February. One or two small distress lots of this grade were reported sold at 5.875 cents but the aforementioned buyer was attempting to shade this figure materially and, according to reports, had had little success up to the close of business Dec. 28.

The bulk of 45 water white kerosene sales were at 6 to 6.25 cents. One refiner early in the week reported selling one lot of 15 cars at 6.125 cents and a second lot of 10 cars at the same price for January shipment.

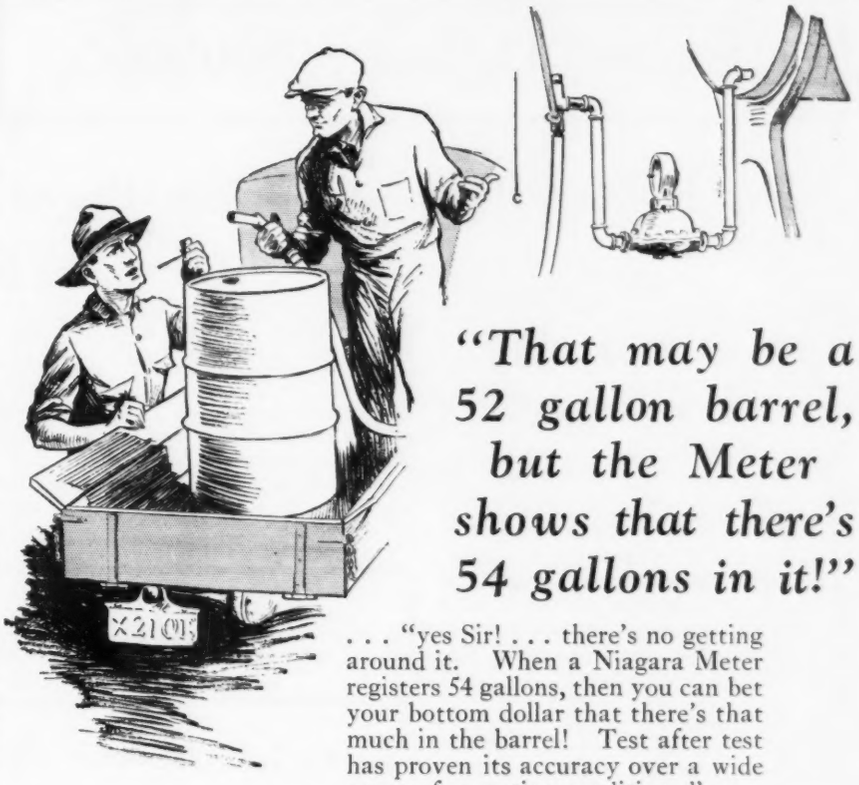
Higher gravity kerosenes were quoted 0.25 cent lower. Demand for these grades was relatively light.

Quotations for U. S. Motor gasoline slipped an 0.125 cent further in some districts. This grade was offered freely at 8 to 8.25 cents. Sales were reported as low as 7.75 cents and one refiner continued to quote 8.75 cents. Price ranges for higher gravity gasolines narrowed to the extent of 0.25 to 0.5 cent as sellers who had been quoting top prices lowered their quotations.

Fuel oil prices were generally unchanged and demand was reported only fairly good. Some traders asserted they were able to get premiums of from 0.125 to 0.25 cent for zero cold test fuels while others continued to offer these grades at the same prices quoted for higher cold test oils.

Steam refined stock dropped 1 cent a gallon. Sales of filterable 600 steam refined were reported at 24 cents against a low of 25 cents prevailing a week ago. Confirmation was lacking of sales reported at from 23 to 23.50 cents.

Bright stock also dropped 1 cent a gallon. The spot market for this commodity was influenced to some extent by distress contract goods which was dumped on the open market.

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# Eastern Domestic Markets

## January Buying Fair at Current Prices

Staff Special
NEW YORK, Dec. 28

PRICES for all commodities again were unchanged at supplying points on the eastern seaboard the past week. Jobbers bought gasoline sparingly but showed some interest in next month's prices. Kerosene sales fell off due principally to the holiday season. Heavier oils moved well but there were more offerings at the lows of present price ranges.

January prices probably were uppermost in the minds of refiners and jobbers and opinions were rife as to what they would be. Some refiners believed quotations would be unchanged from those of the past several weeks and offered goods at today's market; others believed there would be a slight decline. One large refiner believed there would be an advance but had made no quotations such as would tend to substantiate his belief.

Several sellers at New York late in the week quoted 8.75 cents, the prevailing market for U. S. Motor, over January. One refiner quoted on two accounts which represented quite a bit of busines. The buyers had until the end of the month to decide whether or not they would take the gasoline and up to the close of business Dec. 28 had taken no action in the matter. A broker had orders on his books for 2,000,000 gallons of gasoline, for shipment to points in New York harbor and other nearby points, but he did not reveal prices. He also had a deal pending, he said, for 500,000 gallons to be shipped the first week in January.

Some sellers asserted they were not receiving any orders for next month but indicated they would quote today's market should any come in. Generally the opinion was that jobbers were not greatly interested in next month's purchases being content to keep their storage at a minimum to take advantage of any reduction in prices which might be made.

Philadelphia markets were in much the same position as they were at New York. One Philadelphia refiner who a short time ago raised his price to 9.50 cents, reported he had made some sales at that figure. He had not fixed a quotation for January, nor had many other suppliers.

Jobbers in New England have shown no interest in next month's prices and a majority of suppliers there reported business quiet the past week. One seller said his shipments were below normal although he had not changed his price from 10.25 cents, delivered. A refiner at Boston was reported shading the price slightly, but others asserted they were not deviating from the above mentioned price.

One of the principal eastern refiners reported it had closed a contract with the government the past week to supply four eastern airports with aviation gasoline over the first six months of 1930. The total gallonage would be approximately 500,000 gallons, it was said. The company's spot tank car price for this grade of goods is 12.50 cents per gallon, f.o.b. New York.

Kerosene sales fell off at all points although there was no decline in prices. Many refiners attributed the decrease in sales to the holidays and also to the fact that Pennsylvania goods continued to be offered at lower prices. A Boston seller said that competition from Pennsylvania was more noticeable in Connecticut than any other point in his territory.

Prices for gas oil and furnace oil were unchanged but more suppliers were offering goods at the lows of existing price ranges than during the previous week. This was particularly noticeable at New York for shipment into New Jersey, the trade said.

# Gulf Coast Markets

## Cased Gasoline, Kerosene Prices Rise

Staff Special
NEW YORK, Dec. 28

MARKETS at the Gulf, both export and domestic, ended the year very quietly. Quotations for bulk goods were unchanged although suppliers' ideas of cased goods prices were slightly higher.

Water white kerosene in cases was generally quoted at $1.85 and prime white $1.75, an increase of 5 cents on both commodities over the previous week. Light gasoline, 64-66, 375 end point, was also 5 cents higher selling at $2.05 per case. No change was made in the price of U. S. Motor which was quoted at the same price as water white kerosene.

There was no particular reason given for the increased prices although it was reported that orders from South America, particular for shipment to the east coast, were more numerous. Far East buyers were seeking small lots of kerosene, several of the trade reported, which might be taken as an indication of a better market as most of the kerosene shipped to the Far East moves from California. One supplier said he was not taking orders for less than 1000 cases at these prices.

Inactivity of foreign buyers was not taken as an indication of unusual conditions abroad; it was attributed largely to the holidays. Accounts on the other side ceased to show any interest in the market two weeks ago following a period of about a month when there was a fair amount of buying. The trade reported that was usually the case in years past.

Contrary to some opinions of last week that Panuco crude stocks were at a low level, an informant this week said there was plenty of goods in storage but that they were closely held. He did not expect to see prices advance much beyond their present level. Asphalt manufacturers, probably the heaviest buyers of Panuco, are reported to have refused to pay higher than $0.70 per barrel, exclusive of tax, for their spot requirements.

Two reports were heard concerning a 30,000 barrel shipment of U. S. Motor said to have been made to New York late in the week at 8.50 cents, delivered. It was reported in some quarters that this shipment had moved from the Gulf; in others it was said that the goods had been supplied from Philadelphia. Several of the trade in close touch with the market were inclined to doubt the verity of either report. They pointed out that U. S. Motor was available at the Gulf for shipment to New York at 8.25 cents, delivered.

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**May Deduct Gas Tax Refund**

WASHINGTON, D. C., Dec. 28.—If a gasoline tax refund has not been made consumers in Massachusetts may deduct the amount of the tax they have paid in computing federal income tax, so the income tax unit of the Bureau of Internal Revenue has ruled.

The bureau held that the gasoline tax in Massachusetts was levied on the consumer, and hence he was entitled to the deduction. If the tax, however, is part of the business expense of the consumer it cannot be deducted separately in a personal income tax return.

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# Wax Markets

## Scale Prices React Slightly

NEW YORK, Dec. 28.—Wax markets were affected by the holiday the past week to the extent that business was virtually at a standstill as far as spot orders were concerned. Prices both at the Gulf and New York were unchanged with the exception of those for white crude scale at New York.

Actual transactions were extremely few and it was difficult to say just what the market was, the trade reported. New York suppliers were asking 3 to 3.125 cents for white crude scale against a minimum of 3.125 cents flat last week. A New York broker reported selling a quantity of this grade for January and February shipment to Europe at 3 cents, f.a.s. New York harbor.

A buyer late in the week reported considerable difficulty in obtaining a single car lot of white crude scale at 3 cents. This would indicate refiners were willing to accept 3 cents only on larger volume orders.

Some white crude scale moved to the Far East the past week but most of it was under contract. A New York supplier who ships considerable goods to Japan was of the opinion that Far East markets would be inactive until late in January. There were reports that several companies with foreign terminals were offering goods at prices lower than those prevailing at New York or the Gulf.

A minimum of 3 cents was quoted openly at the Gulf for white crude scale but there was a report of one sale having been made at 2.80 cents per pound for export; confirmation of the deal, however, was lacking. Buyers were of the opinion that 3 cents could be shaded with firm offer in several quarters.

Fully refined waxes were unchanged in price and there was very little interest shown from any source. The heavy buying reported recently from Mexico fell off considerably the day before Christmas inasmuch as purchases made thereafter would be affected by the new 7-cent tax imposed by the Mexican government.

Yellow crude scale prices were at a low of 2.875 cents at New York and New Orleans; several sellers at New York were asking 3 cents. Match wax was quoted at 4.25 cents, f.a.s. New Orleans, with demand reported quiet. There were no inquiries reported for semi-refined wax.

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NEWARK, O.—Leslie Grove is now selling Havoline oil here, having sold out the Grove Oil Co. to Ernest King recently.

# Crude Oil Prices (in Effect Dec. 30, 1929)

*(Crude prices for the whole year in OIL PRICE HANDBOOK published annually)*

**EASTERN FIELDS**
(All Penna. Crude prices effective Oct. 1, 1929)
**(Posted by Joseph Seep Purchasing Agency)**
Penna. Grade Oil in New York Transit Lines (Alleghany, N. Y. District).....*$3.05
Bradford District Oil in National Transit Lines (Bradford District).....*3.05
Penna. Grade Oil in National Transit Lines (Other Pennsylvania).....*3.05
Penna. Grade Oil in Southwest Penna. Pipe Lines (Other Pennsylvania)..... 3.00
Penna. Grade Oil in Eureka Pipe Lines (West Virginia)..... 2.90
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O. district)..... 2.70
Wayne district crude in Cumberland lines (West Virginia).....$1.42
Corning Grade in Buckeye Pipe Lines (Ohio) (Effective Dec. 6, 1929)..... 1.80
Corning, O., heavy grade (Effective Dec. 6, 1929) 1.70
Somerset Oil in Cumberland Pipe Lines (Kentucky) (Effective Nov. 12, 1929)..... 1.55
Somerset Oil in Eureka Pipe Lines (Effective Nov. 12, 1929)..... 1.29
Ragland Grade in Cumberland Pipe Lines (Kentucky) (Effective Jan. 29, 1929).....$0.60
***Oil run prior to July 1, 1929 is $3.00 per bbl.**

**(Posted by Stoll Oil Refining Co.)**
Oil City, Ky., oil in Stoll lines (Effective Oct. 7, 1929)..... $1.70

**MICHIGAN**
**(Posted by Dixie Oil Co.)**
Traverse and Dundee (Muskegon):

| | | | |
|---|---|---|---|
| 32-32.9 | $1.25 | 39-39.9 | $1.60 |
| 33-33.9 | 1.30 | 40-40.9 | 1.65 |
| 34-34.9 | 1.35 | 41-41.9 | 1.70 |
| 35-35.9 | 1.40 | 42-42.9 | 1.75 |
| 36-36.9 | 1.45 | 43-43.9 | 1.80 |
| 37-37.9 | 1.50 | 44 and above | 1.85 |
| 38-38.9 | 1.55 | | |

**(Posted by Pure Oil Co.)**
Midland, Midland County.....$1.50

**CENTRAL STATES FIELDS**
**Posted by Ohio Oil Co.**
Effective May 21, 1929

| | | | |
|---|---|---|---|
| Wooster | $1.90 | Princeton | $1.75 |
| Lima | 1.80 | Illinois | 1.75 |
| Waterloo | 1.20 | Plymouth | 1.28 |
| Indiana | 1.57 | West Kentucky | 1.68 |

**CANADIAN CRUDE**
**Posted by Imperial Oil Refineries, Ltd.**
Petrolia.....$2.20
Oil Springs..... 2.27

**OKLAHOMA, KANSAS and NORTH TEXAS**
**Prices of Paririe Oil & Gas Co.**
**(In Oklahoma, Kansas, North and East Central Texas)**
Effective May 20, 1929

| | | | |
|---|---|---|---|
| Below 25 | $0.85 | 35-35.9 | $1.40 |
| 25-25.9 | 0.90 | 36-36.9 | 1.45 |
| 26-26.9 | 0.95 | 37-37.9 | 1.50 |
| 27-27.9 | 1.00 | 38-38.9 | 1.55 |
| 28-28.9 | 1.05 | 39-39.9 | 1.60 |
| 29-29.9 | 1.10 | 40-40.9 | 1.65 |
| 30-30.9 | 1.15 | 41-41.9 | 1.70 |
| 31-31.9 | 1.20 | 42-42.9 | 1.75 |
| 32-32.9 | 1.25 | 43-43.9 | 1.80 |
| 33-33.9 | 1.30 | 44 and above | 1.85 |
| 34-34.9 | 1.35 | | |

**Humble Oil & Refining Co. Prices**
(Ranger, North Texas, Mexia, Powell, Boggy Creek, Richland, Wortham, Lytton Springs, Currie, Moran and Nocona crudes all in Texas.)
May 20, 1929, same schedule as Prairie in above fields.

**Magnolia Petroleum Co.**
(In Oklahoma, Kansas and North and East Central Texas)
May 20, 1929, Magnolia posted in above fields and in Panola Co., same schedule as Prairie, except these grades:

| | | | |
|---|---|---|---|
| Below 26 | $0.70 | 29-29.9 | 0.95 |
| 26-26.9 | 0.75 | 30-30.9 | 1.05 |
| 27-27.9 | 0.85 | 31-31.9 | 1.15 |
| 28-28.9 | 0.90 | | |

May 20, 1929, Glasscock, Crane, Upton, Winkler, Howard and Mitchell Counties same prices as Humble's postings in West Texas which see.
Iatan district.....$0.93
Corsicana heavy..... 0.80
Luling..... 0.90
Mirando..... 0.90

**Carter Oil Co.**
(Oklahoma and Kansas)
May 20, 1929, same schedule as Prairie except Carter does not post oil below 25.

**PANHANDLE, TEXAS**
**Humble Oil & Refining Co.**
Effective May 20, 1929
Hutchinson and Carson Counties:

| | | | |
|---|---|---|---|
| Below 32 | $0.90 | 38-38.9 | $1.25 |
| 32-32.9 | 0.95 | 39-39.9 | 1.30 |
| 33-33.9 | 1.00 | 40-40.9 | 1.35 |
| 34-34.9 | 1.05 | 41-41.9 | 1.40 |
| 35-35.9 | 1.10 | 42-42.9 | 1.45 |
| 36-36.9 | 1.15 | 43-43.9 | 1.50 |
| 37-37.9 | 1.20 | 44 and above | 1.55 |

Wheeler County:

| | | | |
|---|---|---|---|
| Below 30 | $0.90 | 37-37.9 | $1.30 |
| 30-30.9 | 0.95 | 38-38.9 | 1.35 |
| 31-31.9 | 1.00 | 39-39.9 | 1.40 |
| 32-32.9 | 1.05 | 40-40.9 | 1.45 |
| 33-33.9 | 1.10 | 41-41.9 | 1.50 |
| 34-34.9 | 1.15 | 42-42.9 | 1.55 |
| 35-35.9 | 1.20 | 43-43.9 | 1.60 |
| 36-36.9 | 1.25 | 44 and above | 1.65 |

Gray County:

| | | | |
|---|---|---|---|
| Below 29 | $0.90 | 37-37.9 | $1.35 |
| 29-29.9 | 0.95 | 38-38.9 | 1.40 |
| 30-30.9 | 1.00 | 39-39.9 | 1.45 |
| 31-31.9 | 1.05 | 40-40.9 | 1.50 |
| 32-32.9 | 1.10 | 41-41.9 | 1.55 |
| 33-33.9 | 1.15 | 42-42.9 | 1.60 |
| 34-34.9 | 1.20 | 43-43.9 | 1.65 |
| 35-35.9 | 1.25 | 44 and above | 1.70 |
| 36-36.9 | 1.30 | | |

Above prices met by The Texas Co. and Magnolia on May 20.

**WEST TEXAS**
**Humble Oil & Refining Co.**
Effective May 20, 1929
Winkler, Crane, Upton, Crockett, and Pecos Counties, also Lea County, N. Mex.

| | | | |
|---|---|---|---|
| Below 25 | $0.70 | 31-31.9 | 0.98 |
| 25-25.9 | $0.74 | 32-32.9 | $1.02 |
| 26-26.9 | $0.78 | 33-33.9 | 1.06 |
| 27-27.9 | 0.82 | 34-34.9 | 1.10 |
| 28-28.9 | 0.86 | 35-35.9 | 1.14 |
| 29-29.9 | 0.90 | 36 and above | 1.18 |
| 30-30.9 | 0.94 | | |

Howard and Glasscock counties:
Effective Nov. 27, 1929

| | | | |
|---|---|---|---|
| Below 25 | $0.70 | 31-31.9 | $0.90 |
| 25-25.9 | .74 | 32-32.9 | .92 |
| 26-26.9 | .78 | 33-33.9 | .94 |
| 27-27.9 | .82 | 34-34.9 | .96 |
| 28-28.9 | .84 | 35-35.9 | .98 |
| 29-29.9 | .86 | 36 and above | 1.00 |
| 30-30.9 | .88 | | |

May 20, 1929, The Texas Co. posted same prices as Humble in Crane, Upton, Pecos and Winkler., and Magnolia in Crane, Upton, Winkler, Glasscock, Howard and Mitchell.

**SOUTHWEST TEXAS**
**(Posted by Humble Oil & Refining Co.)**
Effective May 20, 1929
Mirando.....$0.90
Salt Flat..... 1.25

**NORTH LOUISIANA—ARKANSAS FIELDS**
**Prices of Standard Oil Co. of Louisiana**
Caddo, Homer, Haynesville, Bull Bayou, El Dorado, Crichton, De Soto and **Cotton Valley.
Effective May 22, 1929

| | | | |
|---|---|---|---|
| Below 28 | $1.00 | 36-36.9 | $1.45 |
| 28-28.9 | 1.05 | 37-37.9 | 1.50 |
| 29-29.9 | 1.10 | 38-38.9 | 1.55 |
| 30-30.9 | 1.15 | 39-39.9 | 1.60 |
| 31-31.9 | 1.20 | 40-40.9 | 1.65 |
| 32-32.9 | 1.25 | 41-41.9 | 1.70 |
| 33-33.9 | 1.30 | 42-42.9 | 1.75 |
| 34-34.9 | 1.35 | 43-43.9 | 1.80 |
| 35-35.9 | 1.40 | 44 and above | 1.85 |

**Cotton Valley, below 36, $0.85. Beginning with 36-36.9, same schedule as above.
Smackover, below 24.....$0.85
do 24 and above..... 1.00
Bellevue..... 1.30
*Urania, La..... 1.10
†East El Dorado..... 0.75
*Posted by Louisiana Oil Refining Corp.
†Posted by Magnolia Petroleum Co.
May 20, The Texas Co. same schedule in Louisiana as Standard, plus these grades: 24-24.9, $0.85; 25-25.9, $0.90; 26-26.9, $0.95; 27-27.9, $1.00.
May 22, Magnolia, Atlantic, Shreveport-Eldorado Pipe Line, Louisiana Oil, and Gulf Companies met Standard schedule in Louisiana-Arkansas fields.

**STEPHENS, ARKANSAS**
**Louisiana Oil Refining Corp., and Atlantic Oil Producing Co.**
Effective May 22, 1929

| | | | |
|---|---|---|---|
| Below 28 | $0.90 | 30-30.9 | $1.02 |
| 28-28.9 | 0.94 | 31-31.9 | 1.06 |
| 29-29.9 | 0.98 | 32 and above | 1.10 |

**GULF COASTAL**
**Posted by Humble Oil & Refining Co.**
Effective May 20, 1929

| | | | |
|---|---|---|---|
| Grades A | $1.30 | 29-29.9 | $1.30 |
| Grades B: | | 30-30.9 | 1.33 |
| Below 25 | $1.15 | 31-31.9 | 1.36 |
| 25-25.9 | 1.18 | 32-32.9 | 1.39 |
| 26-26.9 | 1.21 | 33-33.9 | 1.42 |
| 27-27.9 | 1.24 | 34-34.9 | 1.45 |
| 28-28.9 | 1.27 | 35 and above | 1.48 |

Fields classified as A and B are Spindletop, Goose Creek, Hull, Liberty, Sour Lake, West Columbia, Orange, Boling, Pierce Junction, Sugarland and Raccoon Bend. All other fields are Grades A only.

### Gulf Lubes Continue Quiet

HOUSTON, Dec. 28.—Continued quiet prevailed in the Gulf Coastal lubricant markets. Instances of the shading of list prices on some grades of goods were reported, but these were not widespread. With two or three exceptions on individual grades, the lists were being generally maintained. Manufacturers report better December business than usual for the month in other years.

### Georgia Gasoline Tax Ruling

WASHINGTON, Dec. 9.—The general counsel of the Bureau of Internal Revenue has ruled that the motor fuel and kerosene tax imposed by the state of Georgia is an occupational levy upon the seller of the petroleum products. The dealer in such products, he holds, is therefore entitled to deduct the amount of the tax paid from his income tax return and not the purchaser of the petroleum products. The question arose in connection with an exemption claimed by the buyer of gasoline and other petroleum products.

### Gas Association Opens Dallas Office

NEW YORK.—The expansion of the natural gas industry in the west and southwest has prompted the American Gas Association to close its Pittsburgh, Pa. office Jan. 1, and to open an office at Dallas, Texas, according to Alexander Forward, in charge of the New York headquarters.

E. J. Stephany, secretary of the natural gas department, will continue in charge of that division at Dallas.

### Standard Building 12 Tankers

NEW YORK—Six new tankers of 16,000 deadweight tons, and two of 18,000 deadweight tons will be added to the present fleet of the foreign and domestic subsidiaries of the Standard Oil Co. (New Jersey) by the end of 1930, according to "The Lamp," company publication.

Four additional bulk oil carriers of approximately 13,500 deadweight tons are now under construction, making 12 new tankers in all.

Six vessels will be equipped with diesel engines, and two will be turbine ships.

This represents the largest construction program for any one time ever undertaken by the Standard Shipping Co.

# Tank Wagon Service Station Markets for Gasoline and Kerosene

***(OIL PRICE HANDBOOK has t. w. and s. s. markets for a whole year, arranged for quick reference)***

These Prices in Effect Dec. 28, 1929, as Posted by Principal Marketing Companies

## S.O. NEW JERSEY TERRITORY

| | Gasoline T.W. | Tax | Total T.W. | S.S. | Oil T.W. |
|---|---|---|---|---|---|
| Atlantic City, N. J. | 14 | 2 | 16 | 18 | 13 |
| Newark, N. J. | 15 | 2 | 17 | 19 | 13 |
| Annapolis, Md. | 15 | 4 | 19 | 21 | 13 |
| Baltimore, Md. | 15 | 4 | 19 | 21 | 12 |
| Cumberland, Md. | 16 | 4 | 20 | 22 | 13 |
| Washington, D. C. | 15 | 2 | 17 | 19 | 12 |
| Danville, Va. | 16 | 5 | 21 | 23 | 12 |
| Norfolk, Va. | 15 | 5 | 20 | 22 | 12 |
| Richmond, Va. | 15 | 5 | 20 | 22 | 13 |
| Roanoke, Va. | 16 | 5 | 21 | 23 | 13 |
| Petersburg, Va. | 16 | 5 | 21 | 23 | 13 |
| Charleston, W. Va. | 15 | 4 | 19 | 21 | 13 |
| Keyser, W. Va. | 16 | 4 | 20 | 22 | 13 |
| Parkersburg, W. Va. | 15 | 4 | 19 | 21 | 12 |
| Wheeling, W. Va. | 16 | 4 | 20 | 22 | 13 |
| Charlotte, N. C. | 12 | 5 | 17 | 19 | 13 |
| Hickory, N. C. | 16 | 5 | 21 | 23 | 13 |
| Mt. Airy, N. C. | 14 | 5 | 19 | 21 | 13 |
| Salisbury, N. C. | 14 | 5 | 19 | 21 | 13 |
| Charleston, S. C. | 15 | 6 | 21 | 23 | 13 |
| Columbia, S. C. | 16 | 6 | 22 | 24 | 13 |

**Note: 2c per gallon discount off t.w. price of gasoline to dealers and commercial consumers thru S. O. New Jersey territory.**

## CONTINENTAL OIL

| | | | | | |
|---|---|---|---|---|---|
| Denver, Colo. | 14 | 4 | 18 | 21 | 15.5 |
| Pueblo, Colo. | 14 | 4 | 18 | 21 | 15.5 |
| Grand Junc., Colo. | 18.5 | 4 | 22.5 | 25.5 | 19 |
| Casper, Wyo. | 15 | 4 | 19 | 22 | 14 |
| Cheyenne, Wyo. | 16.5 | 4 | 20.5 | 23.5 | 15.5 |
| Butte, Mont. | 20.5 | 5 | 25.5 | 28.5 | 20 |
| Helena, Mont. | 20.5 | 5 | 25.5 | 28.5 | 20 |
| Salt Lake City, Utah | 17.5 | 3½ | 21 | 24 | 17 |
| Boise, Ida. | 19.5 | 4 | 23.5 | 26.5 | 19 |
| Twin Falls, Ida. | 19.5 | 4 | 23.5 | 27.5 | 19 |
| Albuquerque, N. M. | 15 | 5 | 20 | 22 | 17 |

## S. O. CALIFORNIA

| | | | | | |
|---|---|---|---|---|---|
| Phoenix, Ariz. | 14 | 4 | 18 | 22 | 20 |
| Los Angeles, Cal. | 16.5 | 3 | 19.5 | 22.5 | 15.5 |
| Fresno, Cal. | 17 | 3 | 20 | 23 | 17 |
| San Francisco, Cal. | 17 | 3 | 20 | 23 | 15.5 |
| Reno, Nev. | 21 | 4 | 25 | 28 | 19 |
| Portland, Ore. | 17.5 | 3 | 20.5 | 23.5 | 16.5 |
| Seattle, Wash. | 17.5 | 3 | 20.5 | 23.5 | 16.5 |
| Spokane, Wash. | 21.5 | 3 | 24.5 | 27.5 | 20.5 |
| Tacoma, Wash. | 17.5 | 3 | 20.5 | 23.5 | 16.5 |

**Note: 4c per gal. discount to dealers off t.w. price of gasoline to customers taking tank truck delivery, thru S. O. California territory except 1c discount at Phoenix to dealers only.**

## S. O. LOUISIANA

| | | | | | |
|---|---|---|---|---|---|
| Little Rock, Ark. | 13 | 5 | 18 | 20 | 13 |
| Alexandria, La. | ‡15 | 4 | ‡19 | 21 | †16 |
| Baton Rouge, La. | 12 | 4 | 16 | 18 | †14.5 |
| Lake Charles, La. | ††16.5 | 4 | ††20.5 | ††22.5 | †16 |
| New Orleans, La. | *11 | 4 | *15 | 15 | †13 |
| Shreveport, La. | 13.5 | 4 | 17.5 | 19.5 | †15 |
| Lafayette, La. | **16 | 4 | **20 | **22 | †14 |
| Bristol, Tenn. | 16 | 5 | 21 | 22 | 14 |
| Chattanooga, Tenn. | 15 | 5 | 20 | 22 | 14 |
| Knoxville, Tenn. | 15 | 5 | 20 | 22 | 16 |
| Nashville, Tenn. | 14 | 5 | 19 | 19 | 16 |
| Memphis, Tenn. | 13 | 5 | 18 | 20 | 12.5 |

**Note: 2c per gallon discount off t.w. price of gasoline to dealers thru S. O. Louisiana territory.**

*New Orleans gasoline prices include 1c parish tax in addition to 4c state tax, and kerosene prices include 1c state tax and 1c parish tax.

†Kerosene price in Louisiana includes 1c state tax.

**Lafayette gasoline prices include 1c parish tax in addition to 4c state tax.

††Lake Charles gasoline prices include 1c parish tax.

‡Alexandria gasoline prices include 1c parish tax.

## S. O. KENTUCKY

| | | | | | |
|---|---|---|---|---|---|
| Ashland, Ky. | 15 | 5 | 20 | 21 | 15.5 |
| Catlettsburg, Ky. | 15 | 5 | 20 | 21 | 15.5 |
| Lexington, Ky. | 15 | 5 | 20 | 22 | 15.5 |
| Louisville, Ky. | 16 | 5 | 21 | 23 | 13 |
| Covington, Ky. | 14 | 5 | 19 | 20 | 15.5 |
| Clarksdale, Miss. | 13 | 5 | 18 | 20 | 12.5 |
| Gulfport, Miss.†† | 17.5 | 5 | 22.5 | 24.5 | 14 |
| Jackson, Miss. | 14 | 5 | 19 | 21 | 13 |
| Natchez, Miss. | 15.5 | 5 | 20.5 | 20.5 | 14 |
| Vicksburg, Miss. | 15.5 | 5 | 20.5 | 22.5 | 14 |

## Latest Changes in Tank Wagon Prices

### Gasoline Changes

**S. O. Kentucky**—T.w. and s.s. cut 1c, Covington, to 19c and 20c, **Dec. 24.**

**S. O. Louisiana**—T.w. and s.s. cut 1c, Little Rock, to 18c and 20c, **Dec. 21.**

**S. O. Ohio**—S.s. only up 1c, Gallia, Meigs and Washington counties, to state wide structure of 18c and 19c, **Dec. 8.** Prices had been 18c for both t.w. and s.s.

T.w. cut 1c, s.s. 2c, Allen county, to 17c and 17c, **Dec. 28.**

T.w. up 1c, s.s. 2c, Stark county, to state wide structure of 18c and 19c, **Jan. 1.** This change is not included in the table, due to prices in the table being those in effect Monday, **Dec. 30.**

**Magnolia Petroleum**—Prices at Muskogee as of **Dec. 19** were incorrect as published in last week's issue. T.w. was cut 1c, s.s. 2c, to 15c and 17c, instead of increased to 18c t.w. and 20c s.s. on that date. Prices are corrected in this issue.

**S. O. New Jersey**—T.w. and s.s. cut 2c, Mt. Airy, to 19c and 21c respectively, **Dec. 28.**

| | Gasoline T.W. | Tax | Total T.W. | S.S. | Oil T.W. |
|---|---|---|---|---|---|
| Birmingham, Ala. | 13 | 4 | 17 | 19 | 13 |
| Mobile, Ala.‡ | 14 | 4 | 18 | 20 | 15 |
| Montgomery, Ala.* | 15 | 4 | 19 | 21 | 16.5 |
| Atlanta, Ga. | 14 | 6 | 20 | 22 | †16.5 |
| Augusta, Ga. | 12 | 6 | 18 | 20 | †15.5 |
| Macon, Ga. | 15 | 6 | 21 | 23 | †16.5 |
| Savannah, Ga. | 16 | 6 | 22 | 24 | †15.5 |
| Jacksonville, Fla. | 16 | 6 | 22 | 24 | 14.5 |
| Miami, Fla. | 17 | 6 | 23 | 25 | 15.5 |
| Tampa, Fla. | 14 | 6 | 20 | 22 | 14.5 |
| Pensacola, Fla.** | 12 | 6 | 18 | 20 | 14.5 |

**Note: Net price of gasoline to dealers is 2c under posted t.w. price thru S. O. Kentucky territory.**

*Local privilege tax of 1 cent on gasoline and ½ cent on kerosene at Montgomery included. ‡Mobile gasoline prices include 1c city tax

†Georgia kerosene prices include 1c state tax.

**Both tank wagon prices include 1c city tax at Pensacola which went into effect Oct. 15, 1926.

††Both tank wagon prices at Gulfport include Harrison county privilege tax of 2c.

## S. O. NEBRASKA

| | | | | | |
|---|---|---|---|---|---|
| Omaha, Neb. | 16.25 | 4 | 20.25 | 22.25 | 13.25 |
| McCook | 17.75 | 4 | 21.75 | 23.75 | 14.75 |
| Norfolk | 16.75 | 4 | 20.75 | 22.75 | 13.75 |
| North Platte | 17.75 | 4 | 21.75 | 23.75 | 14.50 |
| Scottsbluff | 17.75 | 4 | 21.75 | 23.75 | 14.25 |

## S. O. INDIANA

| | | | | | |
|---|---|---|---|---|---|
| Chicago, Ill. | 14 | 3 | 17 | 18 | 13 |
| Decatur, Ill. | 16.2 | 3 | 19.2 | 20.2 | 13.1 |
| E. St. Louis, Ill. | 12.4 | 3 | 15.4 | 15.4 | 12.2 |
| Joliet, Ill. | 16.4 | 3 | 19.4 | 20.4 | 13.3 |
| Peoria, Ill. | 16.2 | 3 | 19.2 | 20.2 | 13.1 |
| Quincy, Ill. | 16.2 | 3 | 19.2 | 20.2 | 12.9 |
| Indianapolis, Ind. | 16.2 | 4 | 20.2 | 21.2 | 14.2 |
| Evansville, Ind. | 16 | 4 | 20 | 21 | 14 |
| South Bend, Ind. | 16.4 | 4 | 20.4 | 21.4 | 14.4 |

| | Gasoline T.W. | Tax | Total T.W. | S.S. | Oil T.W. |
|---|---|---|---|---|---|
| Detroit, Mich. | 16.8 | 3 | 19.8 | 20.8 | 14.7 |
| Grand Rapids, Mich. | 16.7 | 3 | 19.7 | 20.7 | 14.6 |
| Saginaw, Mich. | 16.9 | 3 | 19.9 | 20.9 | 14.8 |
| Green Bay, Wisc. | 16.6 | 2 | 18.6 | 19.6 | 13.4 |
| Madison, Wisc. | 16.3 | 2 | 18.3 | 19.3 | 13.1 |
| Milwaukee, Wisc. | 16.1 | 2 | 18.1 | 19.1 | 12.9 |
| La Cross, Wisc. | 17.2 | 2 | 19.2 | 20.2 | 14 |
| Minneapolis, Minn. | 17.2 | 3 | 20.2 | 21.2 | 13.9 |
| Duluth, Minn. | 17.5 | 3 | 20.5 | 21.5 | 13.9 |
| Mankato, Minn. | 17.1 | 3 | 20.1 | 21.1 | 13.7 |
| Des Moines, Ia. | 16.5 | 3 | 19.5 | 20.5 | 13.3 |
| Davenport, Ia. | 16.5 | 3 | 19.5 | 20.5 | 13.3 |
| Sioux City, Ia. | 16.1 | 3 | 19.1 | 20.1 | 12.9 |
| Mason City, Ia. | 16.5 | 3 | 19.5 | 20.5 | 13.3 |
| St. Louis, Mo. | *15.9 | 2 | 17.9 | 18.9 | 12.3 |
| Kansas City, Mo. | †16.9 | 2 | 18.9 | 19.9 | 11.6 |
| St. Joseph, Mo. | †16.5 | 2 | 18.5 | 19.5 | 12.2 |
| Fargo, N. D. | 18.9 | 3 | 21.9 | 22.9 | 15.9 |
| Grand Forks, N. D. | 19.2 | 3 | 22.2 | 23.2 | 16.2 |
| Minot, N. D. | 18.9 | 3 | 21.9 | 22.9 | 15.9 |
| Pierre, S. D. | 17 | 4 | 21 | 22 | 14.4 |
| Huron, S. D. | 17.3 | 4 | 21.3 | 22.3 | 14.7 |
| Wichita, Kans. | 14.8 | 3 | 17.8 | 18.8 | 11.8 |
| Bartlesville, Okla. | 14.5 | 4 | 18.5 | 19.5 | 11.5 |

S. O. Indiana's quantity contract price schedule thru territory except Chicago on tank truck deliveries of gasoline, figured from the service station price, is 2c for 500 gals. or more a month; 2½c for 2000 gals. or more a month and 3c for 6000 gals. or more a month.

In Chicago and vicinity, these discounts apply. Over 500 gals. per month, 2c per gal. off service station price; over 1,000 gals. per month, 4c per gal. off service station price.

*Includes city tax of ½c.

†Includes city tax of 1c.

## S. O. OHIO

| | | | | | |
|---|---|---|---|---|---|
| **Ohio state-wide.** | 14 | 4 | 18 | 19 | 12 |
| Columbiana, Mercer, Stark, Allen, Darke and Hancock Counties: | 13 | 4 | 17 | 17 | 12 |

**Note:** Discount to dealers and commercial accounts generally thru Ohio is 2c per gal. off t.w. price with some exceptions. In counties where prices are below normal, discount is 3c per gal. off t.w. price.

## MAGNOLIA PETROLEUM

| | | | | | |
|---|---|---|---|---|---|
| Muskogee, Okla. | 11 | 4 | 15 | 17 | 10 |
| Oklahoma City. | 13 | 4 | 17 | 20 | 10 |
| Tulsa, Okla. | 11 | 4 | 15 | 19 | 10 |
| Fort Smith, Ark.† | 11 | †4 | 15 | 17 | 12 |
| Little Rock, Ark. | 13 | 5 | 18 | 20 | 13 |
| Texarkana, Ark.* | 13 | *4 | 17 | 19 | 12 |
| Dallas, Tex. | 13 | 4 | 17 | 21 | 12 |
| Fort Worth, Tex. | 13 | 4 | 17 | 20 | 12 |
| Houston, Tex. | 11 | 4 | 15 | 19 | 11 |
| San Antonio, Tex. | 11 | 4 | 15 | 19 | 11 |
| El Paso, Tex. | 12 | 4 | 16 | 20 | 16 |

*Within city of Texarkana, the state tax on gasoline is 4c per gal. conforming with the Texas state tax. In this district outside of the city the 5c Arkansas tax applies.

†Within city of Fort Smith, Oklahoma tax of 4c applies. In this district outside of the city, the 5c Arkansas tax applies.

## S. O. NEW YORK

Due to local price conditions at many points in S. O. New York territory, actual prices on both gasoline and kerosene are being made at under the posted tank wagon prices published below.

| | | | | | |
|---|---|---|---|---|---|
| Greater New York City: Boroughs of Manhattan, Bronx, Queens & Kings. | 14 | 2 | 16 | 18 | 15 |
| Borough of Richmond. | 15 | 2 | 17 | 19 | 15 |
| Albany, N. Y. | 16 | 2 | 18 | 20 | 15 |
| Buffalo, N. Y. | 14 | 2 | 16 | 18 | 14 |
| Rochester, N. Y. | 14 | 2 | 16 | 18 | 13 |
| Syracuse, N. Y. | 16 | 2 | 18 | 20 | 15 |
| Boston, Mass. | 16 | 2 | 18 | 20 | 15 |
| Augusta, Me. | 16 | 4 | 20 | 20 | 15 |
| Manchester, N. H. | 16 | 4 | 20 | 22 | 15 |
| Burlington, Vt. | 16 | 4 | 20 | 22 | 15 |

**Note:** S. O. New York allows concessions of 1 to 2c per gal. to dealers under posted tank wagon prices.

*The Standard of New York does not operate stations in New York City. This figure is the retail price of a principal station operator in New York selling Socony gasoline.

Above prices include these inspection fees on both gasoline and kerosene, per gallon: Alabama, 1/40c on gasoline, 1/2c kerosene; Arkansas, 1/20c on both; Florida, 1/8c on both; Georgia, 1/10c on both; Indiana, 4/25c to 1/2c on both; Kansas, 3/50c on both; Louisiana, 1/32c on gasoline; Minnesota, 3/50c on both; Missouri, 3/10c to 1/2c on both; Nebraska, 3/50c to 1/2c on both; North Carolina, 1/4c on both; North Dakota, 1/20c on both; Oklahoma, 4/25c on both; South Carolina, 1/8c on both; South Dakota, 1/10c on both; Tennessee, 2/5c on gasoline and 1/2c to 4/5c on kerosene; Wisconsin, 3/50c on both.

Kerosene inspection fees only, per gallon; Iowa, 7/100c; Michigan 1/5c to 4/5c per gal.

In Illinois, cities and villages have the power to appoint oil inspectors and fix inspection fees which is done in some instances. In some cases in the above state or other states there are local inspection fees.

## Tank Wagon, Service Station Markets for Gasoline and Kerosene

Prices in Effect Dec. 28, 1929

### ATLANTIC REFINING

| | Gasoline T.W. | Tax | Total T.W. | S.S. | Oil T.W. |
|---|---|---|---|---|---|
| Pittsburgh, Pa. | 15 | * | 15 | 21 | 13 |
| Philadelphia, Pa. | 15 | * | 15 | 21 | 13 |
| Allentown, Pa. | 15 | * | 15 | 21 | 13 |
| Erie, Pa. | 15 | * | 15 | 19 | 13 |
| Scranton, Pa. | 15 | * | 15 | 21 | 13 |
| Altoona, Pa. | 15 | * | 15 | 21 | 13 |
| Williamsport, Pa. | 14 | * | 14 | 18 | 13 |
| Dover, Del. | 15 | 3 | 18 | 20 | 13 |
| Wilmington, Del. | 15 | 3 | 18 | 20 | 13 |
| Boston, Mass. | 16 | 2 | 18 | 20 | 15 |
| Springfield, Mass. | 16 | 2 | 18 | 20 | 15 |
| Worcester, Mass. | 16 | 2 | 18 | 20 | 15 |
| Fall River, Mass. | 16 | 2 | 18 | 20 | 13 |
| Providence, R. I. | 16 | 2 | 18 | 20 | 13 |
| Hartford, Conn. | 16 | 2 | 18 | 20 | 15 |
| New Haven, Conn. | 16 | 2 | 18 | 20 | 15 |
| Atlantic City, N. J. | 14 | 2 | 16 | 18 | 13 |
| Camden, N. J. | 15 | 2 | 17 | 19 | 13 |
| Trenton, N. J. | 15 | 2 | 17 | 19 | 13 |
| Annapolis, Md. | 16 | 4 | 20 | 22 | 13 |
| Baltimore, Md. | 15 | 4 | 19 | 21 | 12 |
| Hagerstown, Md. | 14 | 4 | 18 | 18 | 12 |
| Richmond, Va. | 15 | 5 | 20 | 22 | 13 |
| Wilmington, N. C. | 15 | 5 | 20 | 22 | 13 |
| Brunswick, Ga. | 16 | 6 | 22 | 24 | **16.5 |
| Jacksonville, Fla. | 16 | 6 | 22 | 24 | 14.5 |

**Note: 2c per gal. discount off t.w. price of gasoline on sales to dealers; discount to commercial accounts under contract for one year in accordance with Code of Ethics.**

*4-cent state tax is collected by retail dealer and paid by him directly to state.

**Georgia kerosene prices include 1c state tax.

### V. M. & P. NAPHTHA

(Changes ordinarily occur coincident with gasoline price changes)

| | Oleum Spirits | V.M.&P. Naphtha | Cleaner Naphtha |
|---|---|---|---|
| Chicago | 14.7 | 16.7 | 17 |
| Detroit | 17.4 | 18.9 | 20.7 |
| Kansas City | †15.9 | †17.4 | †19.2 |
| Milwaukee | 16.4 | *19.9 | *21.7 |
| Minneapolis | **19.7 | **21.2 | *23 |
| St. Louis | 15.6 | 17.1 | 18.9 |
| New York | | 16 | 23 |
| Boston | | 19 | 23 |

*Includes 2c state tax. †Includes 1c city tax.
**Includes 3c state tax.

### Petroleum Spirits (Solvent)

**Tank Cars (F.o.b. refinery or seaboard terminal)**

New York harbor ..... 11.50–12.00
Philadelphia district ..... 11.50–12.00

**Tank Wagon or Steel Barrels**

| | |
|---|---|
| New York City | 16–18 |
| New England | 18–19 |
| New Jersey | 16–18 |
| Pennsylvania | 16–19 |

**Note: 2c off above t.w. prices to large buyers in some instances.**

### CANADA

(Per Imperial Gallon, which is 1.2 American Gallons)

| | Gasoline T.W. | Tax | Total T.W. | S.S. | Oil T.W. |
|---|---|---|---|---|---|
| **ONTARIO** | | | | | |
| Toronto | 19.5 | 5 | 24.5 | 28 | 20.5 |
| Ottawa | 19.5 | 5 | 24.5 | 28 | 20.5 |
| Cochrane | 24.5 | 5 | 29.5 | .. | 25.5 |
| Ft. William | 22.5 | 5 | 27.5 | 31 | 22.5 |
| Border Cities, including Windsor | 18.5 | 5 | 23.5 | 27 | 19.5 |
| **MANITOBA** | | | | | |
| Winnipeg | 21.5 | 3 | 24.5 | 28 | 21.5 |
| **SASKATCHEWAN** | | | | | |
| Regina | 26 | 3 | 29 | 33 | 26 |
| **ALBERTA** | | | | | |
| Edmonton | 27.5 | 5 | 32.5 | 36 | 27.5 |
| Calgary | 23.5 | 5 | 28.5 | 32 | 23.5 |
| **BRITISH COLUMBIA** | | | | | |
| Vancouver | 23 | 3 | 26 | 30 | 24 |
| **QUEBEC** | | | | | |
| Montreal | 20.5 | 5 | 25.5 | 29 | 21.5 |
| Quebec City | 21.5 | 5 | 26.5 | 30 | 22.5 |
| Three Rivers | 21.5 | 5 | 26.5 | 30 | 22.5 |
| **NEW BRUNSWICK** | | | | | |
| St. John | 22 | 5 | 27 | 31 | 24 |
| Moncton | 22 | 5 | 27 | 31 | 24 |
| **NOVA SCOTIA** | | | | | |
| Halifax | 22 | 5 | 27 | 31 | 24 |
| Sydney | 22 | 5 | 27 | 31 | 24 |
| **PRINCE EDWARD ISLAND** | | | | | |
| Charlottetown | 22 | 5 | 27 | 31 | 24 |

Note: In districts surrounding these points 1c additional is added to city price.

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COASTAL AND PARAFFINE CRUDES
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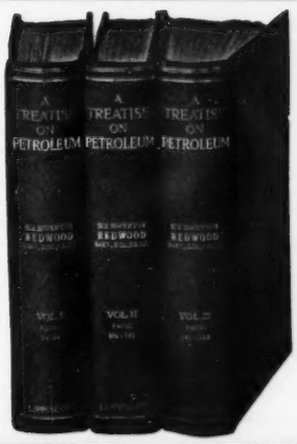
WAX — PETROLEUM COKE
CYLINDER—ENGINE—CORDAGE

# Gulf Refining Company

*General Sales Offices*
**PITTSBURGH, PA.**

*District Sales Offices*
New York, Boston, Philadelphia, Louisville, Atlanta, Houston, New Orleans



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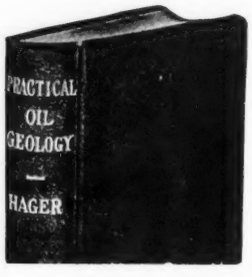


## Practical Oil Geology

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## Field Geology

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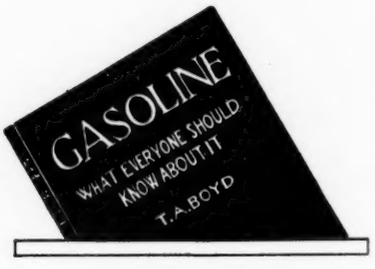


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# Crude Oil Prices (in Effect Dec. 30, 1929)

*(Crude Oil Prices for the whole year in OIL PRICE HANDBOOK published annually)*

### GULF COASTAL

**Prices of The Texas Co.**

Effective May 20, 1929

| | | | |
|---|---|---|---|
| Grades A | $1.30 | *Grades B | $1.15 |
| ‡Grades B (light crude): | | | |
| 35–35.9 | $1.49 | 40–40.9 | $1.69 |
| 36–36.9 | 1.53 | 41–41.9 | 1.73 |
| 37–37.9 | 1.57 | 42–42.9 | 1.77 |
| 38–38.9 | 1.61 | 43–43.9 | 1.81 |
| 39–39.9 | 1.65 | 44 and above | 1.85 |

*Grades B include all heavy crudes which do not meet tests for Grades A or for Gulf Coast light crude.

‡The Texas Co.'s gravity and price schedule on all oil below 35° is same as Humble's postings on Grades B.

### ROCKY MOUNTAIN FIELDS

**Prices of Ohio Oil Co., and Midwest Refining Co.**

(Salt Creek prices effective May 20, 1929)

| | |
|---|---|
| ‡Salt Creek 29–29.9 | $1.10 |
| " " 30–30.9 | 1.15 |
| " " 31–31.9 | 1.20 |
| " " 32–32.9 | 1.25 |
| " " 33–33.9 | 1.30 |
| " " 34–34.9 | 1.35 |
| " " 35–35.9 | 1.40 |
| " " 36–36.9 | 1.45 |
| " " 37 and above | 1.50 |
| Elk Basin | 1.65 |
| Grass Creek light | 1.65 |
| Bid Muddy | $1.43 |
| Lance Creek | 1.68 |
| Rock Creek | 1.40 |
| Mule Creek | 1.20 |
| Rex Lake | 1.10 |
| ‡Osage | 1.65 |
| ‡Cat Creek, Mont. | 1.65 |
| Sunburst, Mont. | 1.75 |
| ‡Hogback, N. Mex. | 1.70 |
| Artesia, N. Mex. | 1.08 |

‡Posted by Midwest Refining Co. Midwest also buys Grass Creek light and Elk Basin.

### CALIFORNIA

***Standard Oil Co. of California**

| Gravity | Alamitos Heights Huntington Beach Signal Hill Seal Beach | Inglewood Torrance | Olinda-Brea Canon †Richfield | Athens-Rosecrans Dominguez | Elwood Terrace | Whittier La Habra | Coyote Hills | Santa Fe Springs | Newhall McKittrick Kern River | Midway-Sunset Buena Vista & Elk Hills | Lost Hills | Coalinga | Wheeler Ridge | Montebello | Kettleman Hills | *Santa Maria (Orcutt) | *Ventura |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14–14.9 | $ .70 | $ .70 | $ .70 | .... | .... | $ .70 | $ .70 | ..... | $ .50 | $ .50 | $ .50 | $ .50 | $ .50 | $ .70 | .... | $ .65 | $ .70 |
| 15–15.9 | .70 | .70 | .70 | .... | .... | .70 | .70 | .... | .50 | .50 | .50 | .50 | .50 | .70 | .... | .65 | .70 |
| 16–16.9 | .70 | .70 | .70 | .... | .... | .70 | .70 | .... | .50 | .50 | .50 | .50 | .50 | .70 | .... | .65 | .70 |
| 17–17.9 | .70 | .70 | .70 | .... | .... | .70 | .70 | .... | .50 | .50 | .50 | .50 | .50 | .70 | .... | .65 | .70 |
| 18–18.9 | .75 | .75 | .75 | .... | .... | .75 | .75 | .... | .50 | .56 | .56 | .56 | .56 | .70 | .... | .70 | .75 |
| 19–19.9 | .80 | .80 | .80 | .... | .... | .80 | .80 | .... | .50 | .62 | .62 | .62 | .62 | .75 | $1.65 | .70 | .80 |
| 20–20.9 | .85 | .85 | .85 | .... | .... | .84 | .84 | .... | .... | .68 | .68 | .68 | .68 | .80 | for | .70 | .85 |
| 21–21.9 | .89 | .89 | .89 | .... | .... | .88 | .88 | .89 | .... | .74 | .74 | .74 | .74 | .85 | 55° | .86 | .86 |
| 22–22.9 | .93 | .93 | .93 | .... | .... | .91 | .91 | .92 | .... | .80 | .80 | .80 | .80 | .90 | gravity | .87 | .87 |
| 23–23.9 | .97 | .97 | .97 | .... | .... | .... | .94 | .95 | .... | .85 | .85 | .85 | .85 | .95 | and | .90 | .90 |
| 24–24.9 | 1.01 | 1.01 | 1.01 | 1.01 | .... | .... | .97 | .98 | .... | .90 | .90 | .88 | .88 | .98 | over | .94 | .94 |
| 25–25.9 | 1.05 | 1.05 | 1.05 | 1.05 | .... | .... | 1.00 | 1.01 | .... | .95 | .95 | .91 | .91 | 1.01 | .... | .98 | .98 |
| 26–26.9 | 1.09 | 1.09 | 1.09 | 1.09 | .... | .... | 1.04 | 1.04 | .... | 1.00 | 1.00 | .94 | .94 | 1.04 | .... | 1.02 | 1.02 |
| 27–27.9 | 1.13 | 1.13 | 1.13 | 1.13 | .... | .... | 1.08 | 1.07 | .... | 1.05 | 1.05 | .98 | .97 | 1.07 | .... | .... | 1.06 |
| 28–28.9 | 1.17 | 1.17 | 1.17 | 1.17 | .... | .... | 1.12 | 1.10 | .... | 1.10 | 1.10 | 1.02 | .... | 1.10 | .... | .... | 1.10 |
| 29–29.9 | 1.21 | .... | 1.21 | 1.21 | .... | .... | 1.16 | 1.15 | .... | 1.16 | 1.16 | 1.06 | .... | 1.13 | .... | .... | 1.14 |
| 30–30.9 | 1.25 | .... | 1.25 | 1.25 | .... | .... | 1.20 | 1.20 | .... | 1.22 | 1.22 | 1.10 | .... | 1.16 | .... | .... | 1.18 |
| 31–31.9 | 1.30 | .... | 1.30 | 1.30 | .... | .... | .... | 1.25 | .... | 1.28 | 1.28 | 1.14 | .... | .... | .... | .... | 1.23 |
| 32–32.9 | 1.35 | .... | .... | 1.35 | .... | .... | .... | 1.30 | .... | 1.34 | 1.34 | 1.18 | .... | .... | .... | .... | 1.28 |
| 33–33.9 | .... | .... | .... | 1.41 | .... | .... | .... | 1.35 | .... | 1.40 | 1.40 | 1.22 | .... | .... | .... | .... | 1.34 |
| 34–34.9 | .... | .... | .... | 1.47 | $1.16 | .... | .... | 1.40 | .... | .... | 1.46 | 1.26 | .... | .... | .... | .... | .... |
| 35–35.9 | .... | .... | .... | 1.53 | 1.22 | .... | .... | 1.45 | .... | .... | 1.52 | 1.30 | .... | .... | .... | .... | .... |
| 36–36.9 | .... | .... | .... | 1.59 | 1.28 | .... | .... | 1.50 | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| 37–37.9 | .... | .... | .... | 1.65 | 1.34 | .... | .... | 1.55 | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| 38–38.9 | .... | .... | .... | 1.71 | 1.40 | .... | .... | 1.60 | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| 39–39.9 | .... | .... | .... | 1.77 | 1.46 | .... | .... | 1.65 | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| 40–40.9 | .... | .... | .... | 1.83 | 1.52 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| 41–41.9 | .... | .... | .... | 1.89 | 1.58 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| 42–42.9 | .... | .... | .... | 1.95 | 1.64 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |

*Santa Maria and Ventura postings are by Union Oil Co. Union Oil Co. posts same prices in all above fields as Standard except it does not post prices in Wheeler Ridge, Whittier, La Habra, Newhall and Kettleman Hills. Standard does not contract for crude testing 11-13.9 gravity, but pays 45c a barrel when purchased.

†Richfield posted only to 30-30.9 at $1.25.

# REFINERS' and COMPOUNDERS' SUPPLIES

Following are average market prices for materials used by refiners and compounders effective on the date shown.

### Refiners' Supplies

| | Dec. 30 | Dec. 23 |
|---|---|---|
| Soda Ash light 58% bags, cwt. | $1.32 | $1.32 |
| Silicate of Soda 60 deg. drums, cwt. | $1.55 | $1.55 |
| Silicate of Soda 40 deg. tank cars, cwt. | $0.60 | $0.60 |
| Silicate of Soda 40 deg. drums cwt. | $0.80 | $0.80 |
| Sal Soda wks. | $1.00–1.05 | $1.00–1.05 |
| Caustic Soda 76% solid, cwt. | $2.90 | $2.90 |
| Sulfuric Acid 60 deg. tank cars, f.o.b. shipping point per ton | $11.00 | $11.00 |
| Oleum 20%, fuming sulfuric, tank cars, wks. | $18.50 | $18.50 |
| Sulfur, flowers of cwt. | $3.10–4.00 | $3.10–4.00 |
| Liquid Chlorine, tank cars, wks. lb. | 3.50–5.00 | 3.50–5.00 |

### Compounders' Supplies

| | Dec. 30 | Dec. 23 |
|---|---|---|
| **Vegetable Oils** | | |
| Linseed carloads, spot lb. | 14.90 | 14.90 |
| Tanks, spot | 14.10 | 14.10 |
| Soya Bean, Tanks, coast, lb. | 10.50-11.00 | 10.50-11.00 |
| **Oleic Acid** | | |
| Distilled, tanks lb. | 9.75 | 9.75 |
| Distilled, bbls. lb. | 10.625 | 10.625 |
| Saponified, tanks lb. | 9.75 | 9.75 |
| Saponified, bbls. lb. | 10.625 | 10.625 |
| **Lard Oils** | | |
| Prime Winter Strained lb. | 15.25 | 15.25 |
| Extra Winter Strained lb. | 12.75 | 12.75 |
| Extra lb. | 12.50 | 12.50 |
| Extra No. 1 lb. | 12.00 | 12.00 |
| No. 1 lb. | 11.75 | 11.75 |
| No. 2 lb. | 11.50 | 11.50 |
| Tallow oil lb. | 11.00 | 11.00 |
| **Neatsfoot Oil** | | |
| Pure, bbls. lb. | 14.50 | 14.50 |
| Extra, bbls. lb. | 12.25 | 12.25 |
| No. 1 bbls. lb. | 12.00 | 12.00 |
| Cold Pressed lb. | 12.50 | 12.50 |
| **Fish Oils** | | |
| Menhaden Oil | | |
| Light Pressed gal. | 70 | 70 |
| Light Pressed, tank cars, N. Y. gal. | 58–60 | 58–60 |
| White bleached gal. | 78 | 78 |
| Yellow bleached gal. | 71 | 71 |
| Whale, extra winter bleached, gal. | 82 | 82 |
| **Naval Stores** | | |
| Steam, distilled turpentine, N. Y. gal. | 51 | 51 |
| Steam distilled turpentine, Savannah gal. | 46 | 46 |
| Gum turpentine, N. Y. gal. | 55 | 55 |
| Gum turpentine, f.o.b. cars Savannah gal. | 49.25 | 49.25 |
| Wood Rosin F, N. Y. gal. | $7.30 | $7.30 |
| Wood Rosin F, Savn'h bbl. | $6.50 | $6.50 |
| Gum Rosin B, N. Y. bbl. | $8.00 | $8.00 |
| Gum Rosin B, f.o.b. cars Savannah bbl. | $7.30 | $7.30 |
| Rosin oil, pure gal. | 58 | 58 |
| Rosin oil, compounded gal. | 47 | 47 |
| **Pine Tar** | | |
| Kiln burnt bbl. | $13.00–14.00 | $13.00–14.00 |
| Retort bbl. | $13.50–14.50 | $13.50–14.50 |
| **Alcohol** | | |
| Denatured Formula 5, in bbls., per gal. | 59–66 | 59–66 |

# Two more gallons *please*

Tanks never come too big—nor too thirsty for G & B Meter Pumps. The operator merely grabs the nozzle, throws the switch, presses the trigger and fills the tank. No overflowing. No spilling of last drops. At all times the operator has perfect control —right at the car.

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PUMPS AND TANKS FOR THE OIL TRADE
SPRINGFIELD, MASS.

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**"DEPENDABLE PUMPS—FOR EVERY SERVICE STATION NEED"**

# Complete Seaboard Market

*(Export Markets for whole year given in OIL PRICE HANDBOOK. Each volume carries refinery, tank wagon, crude and export markets—complete for the whole year)*

## Eastern Domestic Market

**(Prices for tank car lots, f. o. b. refinery or seaboard terminal, representing majority of quotations.)**

| U. S. MOTOR GASOLINE | Dec. 30 | Dec. 23 | Dec. 16 |
|---|---|---|---|
| New York harbor | 8.75 | 8.75 | 8.75 |
| Portland district | *10.75 | *10.75 | *10.75 |
| Boston district | *10.25 | *10.25 | *10.25 |
| Providence district | *10.25 | *10.25 | *10.25 |
| Philadelphia district | 8.75 – 9.00 | 8.75 – 9.00 | 8.75 – 9.00 |
| Baltimore district | 9.00 | 9.00 | 9.00 |
| Norfolk district | 9.00 | 9.00 | 9.00 |
| Charleston district | 9.00 | 9.00 | 9.00 |
| Savannah district | 9.00 | 9.00 | 9.00 |
| Jacksonville district | 9.00 | 9.00 | 9.00 |
| **CALIFORNIA, U. S. MOTOR GASOLINE** | | | |
| New York harbor | 9.00 | 9.00 | 9.00 |
| Philadelphia district | 9.00 | 9.00 | 9.00 |
| Baltimore district | 9.00 | 9.00 | 9.00 |
| **WATER WHITE KEROSENE** | | | |
| New York harbor | 7.75 | 7.75 | 7.75 |
| Philadelphia district | 7.75 – 8.00 | 7.75 – 8.00 | 7.75 – 8.00 |
| Baltimore district | 7.75 | 7.75 | 7.75 |
| **GAS OIL: 28-34 Gravity** | | | |
| New York harbor | 4.75 – 5.00 | 4.75 – 5.00 | 4.75 – 5.00 |
| Boston district | 4.75 – 5.25 | 4.75 – 5.25 | 4.75 – 5.25 |
| **FURNACE OIL: 36-40 Gravity** | | | |
| New York harbor | 6.00 – 6.25 | 6.00 – 6.25 | 6.00 – 6.25 |
| Boston district | 6.00 – 6.25 | 6.00 – 6.25 | 6.00 – 6.25 |
| **GRADE C BUNKER OIL†** | | | |
| New York Harbor | $1.05 | $1.05 | $1.05 |
| Boston district | $1.05 | $1.05 | $1.05 |
| **DIESEL OIL** | | | |
| New York harbor | $2.00 –$2.10 | $2.00 –$2.10 | $2.00 –$2.10 |
| **MEDICINAL OILS, RUSSIAN** | | | |
| .885-890 s.g. 320-330 vis. | $0.82 –$0.97 | $0.82 –$0.97 | $0.82 –$0.97 |
| .870-875 s.g. 145-155 vis. | $0.74 –$0.89 | $0.74 –$0.89 | $0.74 –$0.89 |

Note: Above gasoline prices do not include inspection tax levied in some states.
*Minimum delivered. †Lighterage 5c per bbl. additional.

## New York Export Market

**(Lubricating oils are per gal. in bbls.)**

| | Dec. 30 | Dec. 23 | Dec. 16 |
|---|---|---|---|
| **CYLINDER OILS (Pennsylvania Products)** | | | |
| Bright stock, dark | 50.00 –53.00 | 51.00 –53.00 | 51.00 –53.00 |
| 600 D filtered | 42.00 –44.00 | 44.00 –46.00 | 44.00 –46.00 |
| 600 Warren E filtered | 36.00 –38.00 | 38.00 –41.00 | 38.00 –41.00 |
| 600 s.r. unfiltered | 32.00 –34.00 | 32.50 –34.00 | 32.50 –34.00 |
| 650 s.r. unfiltered | 37.00 –40.00 | 37.50 –40.00 | 37.50 –40.00 |
| 600 flash, s.r. | 39.00 –42.00 | 40.00 –42.00 | 40.00 –42.00 |
| 630 flash, s.r. | 42.00 –44.00 | 42.50 –45.00 | 42.50 –45.00 |
| **RED ENGINE OILS (Vis. 100°)** | | | |
| 300 vis. No. 6½ color | 20.00 –21.00 | 20.00 –21.00 | 20.00 –21.00 |
| 250 vis. No. 6 color | 18.00 –20.00 | 18.00 –20.00 | 18.00 –20.00 |
| 200 vis. No. 6 color | 16.00 –17.00 | 16.00 –17.00 | 16.00 –17.00 |
| **PALE ENGINE OILS (Vis. 100°)** | | | |
| 230 vis. No. 3¾ color | 22.00 –24.00 | 22.00 –24.00 | 22.00 –24.00 |
| 180 vis. No. 3¼ color | 18.00 –20.00 | 18.00 –20.00 | 18.00 –20.00 |
| 100 vis. No. 2¼ color | 16.00 | 16.00 | 16.00 |
| **MOTOR OILS (Vis. 100°)** | | | |
| 600 vis. No. 7 color | 30.00 –32.00 | 30.00 –32.00 | 30.00 –32.00 |
| 500 vis. No. 6½ color | 28.00 –29.00 | 28.00 –29.00 | 28.00 –29.00 |
| 400 vis. No. 7¼ color | 26.00 –27.00 | 26.00 –27.00 | 26.00 –27.00 |
| 300 vis. No. 6 color | 23.00 –24.00 | 23.00 –24.00 | 23.00 –24.00 |
| 200 vis. No. 6 color | 21.00 –22.00 | 21.00 –22.00 | 21.00 –22.00 |
| **MEDICINAL OILS** | | | |
| .875-.880 s.g. | $0.76 –$0.91 | $0.76 –$0.91 | $0.76 –$0.91 |
| .860-.865 s.g. | $0.58 –$0.73 | $0.58 –$0.73 | $0.58 –$0.73 |
| **WAXES (In cents per pound, f.a.s. carload lots)** | | | |
| **WHITE CRUDE SCALE (In barrels)** | | | |
| 122-124 A.m.p. | 3.00 – 3.125 | 3.125 | 3.125 |
| 124-126 A.m.p. | 3.00 – 3.125 | 3.125 | 3.125 |
| **FULLY REFINED (In burlap bags)** | | | |
| 123-125 A.m.p. Phila. | 4.00 – 4.125 | 4.00 – 4.125 | 4.00 – 4.125 |
| 125-127 A.m.p. | 4.00 – 4.25 | 4.00 – 4.25 | 4.00 – 4.25 |
| 128-130 A.m.p. | 4.25 – 4.50 | 4.25 – 4.50 | 4.25 – 4.50 |
| 130-132 A.m.p. | 4.75 – 5.00 | 4.75 – 5.00 | 5.00 – 5.25 |
| 133-135 A.m.p. | 5.50 – 5.75 | 5.50 – 5.75 | 5.50 – 5.75 |
| 135-137 A.m.p. | 6.00 – 6.25 | 6.00 – 6.25 | 6.125– 6.375 |
| **YELLOW CRUDE SCALE** | | | |
| 124-126 A.m.p. | 2.875– 3.00 | 3.00 – 3.125 | 3.00 – 3.125 |

## Gulf Export Market

**(Prices are f. o. b. Gulf oil terminals in Texas and Louisiana, shipments of 20,000 bbls. or more unless otherwise noted and for export shipment only).**

| GASOLINE | Dec. 30 | Dec. 23 | Dec. 16 |
|---|---|---|---|
| U. S. Motor | 8.50 | 8.50 | 8.50 |
| 60-62, 400 e.p. | 9.50 | 9.50 | 9.50 |
| 61-63, 390 e.p. | 9.75 | 9.75 | 9.75 |
| 64-66, 375 e.p. | 10.00 | 10.00 | 10.00 |
| U. S. Motor, cases (cargoes) | $1.85 | $1.85 | $1.85 |
| 64-66, cases (cargoes) | $2.05 | $2.00 | $2.00 |
| **KEROSENE** | | | |
| 44 water white | 8.00 | 8.00 | 8.00 |
| 41-43 prime white | 7.00 | 7.00 | 7.00 |
| Water white, cases (cargoes) | $1.85 | $1.80 | $1.80 |
| Prime white, cases (cargoes) | $1.75 | $1.70 | $1.70 |
| **DOMESTIC GAS & BUNKER OILS** | | | |
| *26-30 translucent gas oil | 4.00 | 4.00 | 4.00 |
| *30 plus translucent gas oil | 4.00 – 4.25 | 4.00 – 4.25 | 4.00 – 4.25 |
| Grade C bunker oil | $0.95 | $0.95 | $0.95 |
| Grade C bunker oil, cargoes | $0.70 –$0.75 | $0.70 –$0.75 | $0.70 –$0.75 |
| *Less than ½ of 1% sulphur. | | | |
| **MEXICAN CRUDE AND BUNKER OILS (F. O. B. Steamer, Tampico)** | | | |
| Heavy Panuco crude taxes to be paid | $0.70 –$0.80 | $0.70 –$0.80 | $0.65 –$0.70 |
| Grade C bunker oil for bunkering purposes, taxes paid | $0.95 –$1.00 | $0.95 –$1.00 | $0.90 –$0.95 |
| **SOUTH TEXAS LUBRICATING OILS (Viscosity at 100°F. cold test 0. Tanker, f. o. b. Houston)** | | | |
| 100 vis. No. 2 unfiltered pale | 6.00 – 6.50 | 6.00 – 6.50 | 6.00 – 6.50 |
| 200 vis. No. 3 unfiltered pale | 8.25 – 9.00 | 8.25 – 9.00 | 8.25 – 9.00 |
| 300 vis. No. 3 unfiltered pale | 9.75 –10.00 | 9.75 –10.00 | 9.75 –10.00 |
| 500 vis. No. 3½ unfiltered pale | 11.25 –11.50 | 11.25 –11.50 | 11.25 –11.50 |
| 750 vis. No. 4 unfiltered pale | 12.50 –13.00 | 12.50 –13.00 | 12.50 –13.00 |
| 1200 vis. No. 5 unfiltered pale | 16.25 –16.50 | 16.25 –16.50 | 16.25 –16.50 |
| 200 vis. No. 5-6 red oil | 7.00 – 8.00 | 7.00 – 8.00 | 7.00 – 8.00 |
| 300 vis. No. 5-6 red oil | 8.00 – 8.50 | 8.00 – 8.50 | 8.00 – 8.50 |
| 500 vis. No. 5-6 red oil | 9.25 –10.00 | 9.25 –10.00 | 9.25 –10.00 |
| 750 vis. No. 5-6 red oil | 11.00 –12.00 | 11.00 –12.00 | 11.00 -12.00 |
| 1200 vis. No. 5-6 red oil | 15.00 –16.00 | 15.00 –16.00 | 15.00 –16.00 |

## Gulf Domestic Market

**(Prices are f.o.b. Gulf oil terminals in Texas and Louisiana in shipments of 20,000 bbls. or more, representing sellers' opinions, for domestic shipment only).**

| | Dec. 30 | Dec. 23 | Dec. 16 |
|---|---|---|---|
| U. S. Motor gasoline | 7.25 – 7.50 | 7.25 – 7.50 | 7.375– 7.50 |
| 41-43 w.w. kerosene | 6.375– 6.50 | 6.375– 6.50 | 6.375– 6.50 |
| *26-32 translucent gas oil | 3.875– 4.125 | 3.875– 4.125 | 4.00 – 4.125 |
| *Less than ½ of 1% sulphur. | | | |

## Pacific Export Market

**(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gallon, except where otherwise noted.)**

| | Dec. 30 | Dec. 23 | Dec. 16 |
|---|---|---|---|
| Gasoline, U. S. Motor, 53-55 Gravity | 6.25 – 7.00 | 6.25 – 7.00 | 6.25 – 7.00 |
| Gasoline, U. S. Motor-blends and special cuts | 7.25 –10.00 | 7.25 –10.00 | 7.25 –10.00 |
| Gas Oil, 30-34, per barrel | $0.85 –$1.00 | $0.85 –$1.00 | $0.80 –$1.00 |
| Diesel Oil, 27 plus, per barrel | $0.80 –$1.00 | $0.80 –$1.00 | $0.80 –$1.00 |
| Bunker oil, 14-18, per barrel | $0.65 –$0.85 | $0.65 –$0.85 | $0.65 –$0.85 |
| Fuel oil, 14-18 per barrel | $0.60 –$0.85 | $0.60 –$0.85 | $0.60 –$0.85 |
| Kerosene, 38-40 w.w., 125-150 flash, per gal. | 5.75 – 6.25 | 5.75 – 6.25 | 5.75 – 6.25 |
| **Cased Goods** | | | |
| Gasoline, U. S. Motor | $1.75 –$1.85 | $1.75 –$1.85 | $1.75 –$1.85 |
| Kerosene, 38-40 w.w., 125, 150 flash | $1.45 –$1.50 | $1.45 –$1.50 | $1.45 –$1.50 |

## Tanker Rates

**(Approximate tanker freight rates to Continental ports, in shillings per ton of 2240 pounds, British sterling; to American ports, cents per barrel.)**

| | Dec. 30 Crude &/or Fuel | Refined Oil &/or Spirits |
|---|---|---|
| Calif. to U. K. or Continental ports* | 31-33 | 42-43 |
| Gulf to U. K. or Continental ports* | 22-23 | 30–31 |
| North Atlantic to U. K. or Continental ports* | 20-21 | 27/6–28/6 |
| Calif. to North Atlantic ports (not E. of N. Y.) | $0.80-$0.85 | $0.90–$0.95 |
| Gulf to North Atlantic ports (not E. of N. Y.)** | 30–32 | 32-35 |

*Continental ports in the range between Bordeaux and Hamburg, both inclusive.
**Venezuela loading same rate. For Tampico 3c per bbl. additional.

# OIL STOCKS AND FINANCES

National Petroleum News

## White Eagle to Act on Merger With N. Y. Standard Jan. 27

STOCKHOLDERS of White Eagle Oil & Refining Co. will vote at a special meeting Jan. 27 on a proposal to merge with the Standard Oil Co. of New York. The proposed consolidation is to be accomplished by an exchange of 10 shares of White Eagle for 8½ shares of Standard of New York.

The consolidation of the White Eagle and the Standard of New York, if approved by White Eagle stockholders, will be by exchange of 8½ shares of Standard for 10 of White Eagle.

Standard will take possession of all White Eagle assets, assume liabilities, dissolve the present corporation, and organize a new subsidiary which will operate the present White Eagle properties, L. L. Marcell, White Eagle chairman, announced. Mr. Marcell recommended that stockholders vote in favor of the merger.

The Standard has distribution in this country in New York, the New England states, Texas, Oklahoma, Arkansas, New Mexico, Louisiana, California, Arizona, Oregon and Washington. Acquisition of White Eagle will place it in Kansas, Colorado, Utah, Wyoming, Montana, North and South Dakota, Minnesota, Wisconsin, Iowa, Nebraska, and Missouri.

Approval of two thirds the outstanding White Eagle stock is required to make the sale effective. Proxy forms were mailed Dec. 21 with the notices of the merger plan.

Mr. Marcell in a letter to stockholders said in part:

"For some time past I have been impressed with the economic advantages of the development of larger industrial units. The need in modern industry for large capital resources, wide diversity of trade territory and highly specialized research and development organizations is apparent. I have become convinced that in the oil industry such units, particularly through their holdings of large resources of raw material, have a distinct advantage, and further that the practical way for our company to secure these advantages is by an alliance with an organization already possessing them.

"After months of negotiation, our officers and directors have been able to work out a proposal of merger with the Standard Oil Co. of New York. This company has a record of more than 40 years of successful operation and is one of the largest and strongest of the old Standard Oil companies.

"It has through its own organization and wholly owned subsidiaries a crude oil production of over 110,000 barrels per day, net, refineries with a capacity of over 200,000 barrels per day, large trunk lines and tank steamers and other marine facilities for the world-wide transportation of petroleum products.

"I must say a word of appreciation for the loyal support and efficient cooperation which I have received from the officers and employes of the company during the past 10 years. I am authorized to state that the very liberal provisions of the Standard Oil Co. of New York, with respect to stock purchase plans, pensions and other benefits, will be extended to our employes who become employes of the new subsidiary company and these employes will receive credit for years of service with us.

"When this plan is carried through, our stockholders will own shares in a world-wide oil company. It has been the history of the Standard Oil Co. of New York that benefits have constantly accrued to the owners of its shares through appreciation in market value and recurrent split-ups and stock dividends. In addition to the payment of regular cash dividends, at a conservative rate, since 1913, the Standard Oil Co. of New York has paid stock dividends as follows:

| Year | Rate Per cent | Amount |
|---|---|---|
| 1913 | 400 | $ 60,000,000 |
| 1922 | 200 | 150,000,000 |
| 1926 | 25 | 71,582,500 |

"The Standard Oil Co. of New York has as of Dec. 31, 1928, a surplus of $100,571,647.06. It is my confident belief that stock on the Standard Oil Co. of New York will become constantly more valuable with the passage of time."

### Oil Pays Hundred Million in Taxes

NEW YORK—The oil industry paid over $100,000,000 in taxes in 1928, $82,308,285 of which were federal and state income and ad valorem taxes, and $19,916,542 representing taxes and fees on oil and gas production, oil inspection, licenses, permits and miscellaneous levies, according to the American Petroleum Institute. This total does not include taxes paid by the pipe line companies.

Gasoline taxes last year totaled $305,000,000, and indications are that this year that tax will bring in $450,000,000.

## Royal Dutch to Shift Its Foreign Set-up

NEW YORK, Dec. 27.—London dispatches report a rearrangement of some of the properties of subsidiaries that operate in Mexico or are engaged in transportation of petroleum.

Mexican Eagle Oil Co., Ltd., is to exercise its option July 2, 1930, to purchase of 400,000 outstanding £5 preference shares of the Eagle Oil Transport Co. at £6 a share plus dividends accrued on date of purchase.

Mexican Eagle seeks also to acquire through a stock exchange the entire capital stock of the Cia Mexicana Holandesa La Corona, S. A. A meeting of Mexican Eagle stockholders will be held in January to approve an increase in the capital stock. The company will pay 2,000,000 common shares, par 4 pesos each. The acquisition is expected to increase Mexican Eagle's production and effect operating economies.

The common stock of the transport company is owned by the Canadian Eagle Oil Co. The Eagle Transport has 35 tankers and one cargo vessel.

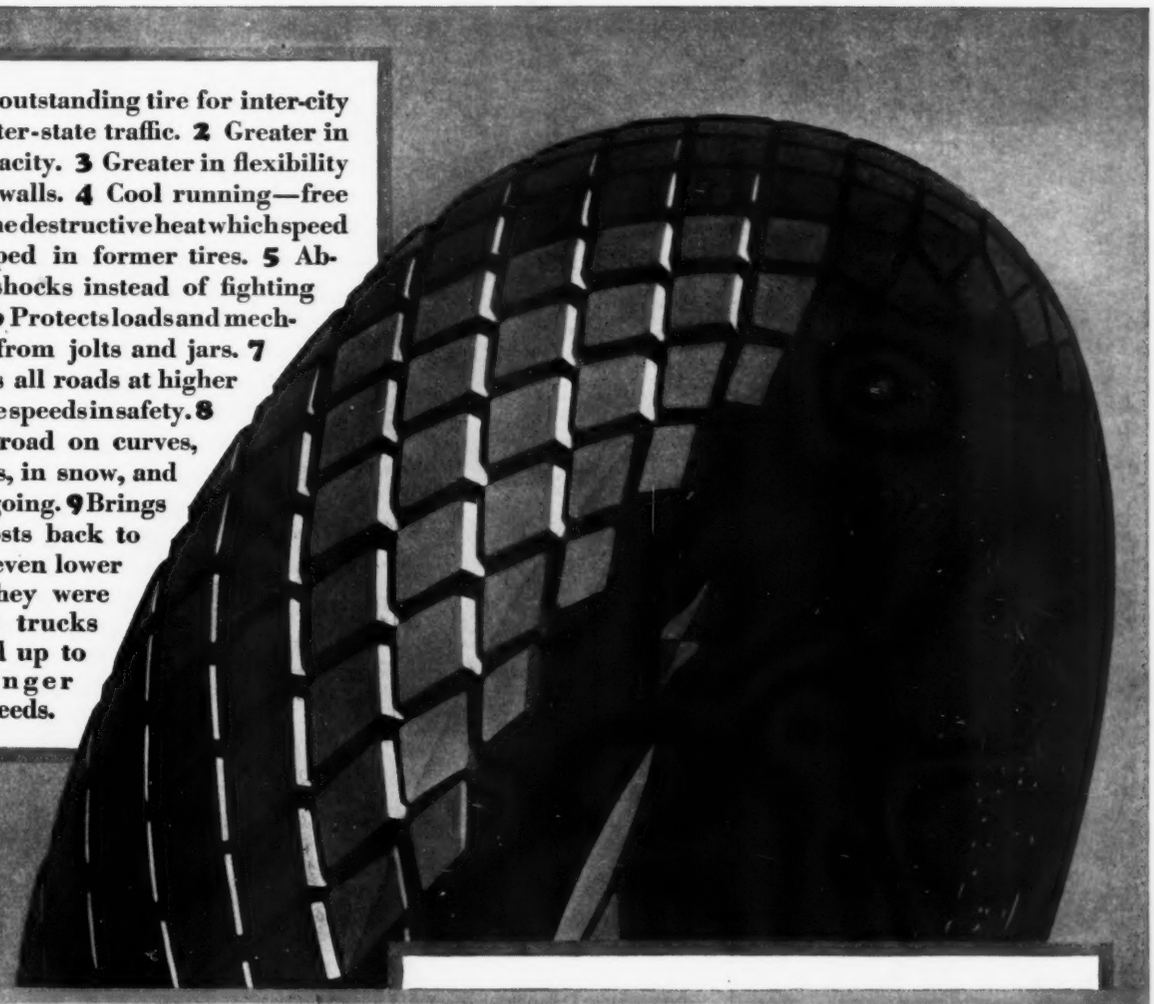
## Old Galena Signal Oil To Be Dissolved

CLEVELAND, Dec. 28.—Stockholders of the Galena Signal Oil Co. were to meet Dec. 30 at Franklin, Pa., to approve dissolution of the corporation whose assets and operations have been taken over by the new Galena Oil Corp.

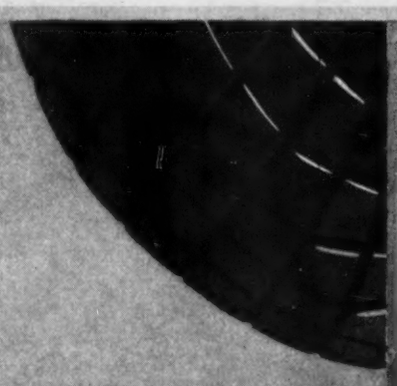
The stockholders' committee has announced that 93 per cent of the preferred stock and 88 per cent of the common stock has been deposited under the reorganization plan, that all

(*Continued on Page* 102)

**1** The outstanding tire for inter-city and inter-state traffic. **2** Greater in air capacity. **3** Greater in flexibility of sidewalls. **4** Cool running—free from the destructive heat which speed developed in former tires. **5** Absorbs shocks instead of fighting them. **6** Protects loads and mechanism from jolts and jars. **7** Travels all roads at higher average speeds in safety. **8** Holds road on curves, on hills, in snow, and in soft going. **9** Brings tire costs back to levels even lower than they were before trucks stepped up to passenger car speeds.



# Balloon Tires *Goodyear's newest development for* Trucks



YOU know what balloon tires have done for passenger cars. Here they are now for trucks—pioneered by Goodyear.

Put them on your trucks — and end the tire troubles due to high speed, long distance operation.

Let your local Goodyear Truck Tire Service Station Dealer show you how easily the change-over can be made on your present trucks. Specify them on new trucks—manufacturers are rapidly adopting them as optional original equipment.

GOODYEAR

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# Transactions in Oil Shares on New York Stock Exchange

| 1928 High | 1928 Low | 1929 High | 1929 Low | Listed Capital | Par Value | Stocks | Div. Rate | Last Paid | Transactions Week Ended Dec. 28 Sales | First | High | Low | Last | Change |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43⅞ | 27⅛ | 42⅝ | 17½ | (sh) 922,075 | N.P. | Amerada Corp | 50cQ | Oct. 31, 29 | 10,600 | 18¾ | 19 | 17½ | 18 | — ⅞ |
| 85 | 51¼ | 64¾ | 12½ | (sh) 209,180 | N.P. | American Republics Corp | .... | ..... | 4,000 | 22½ | 24½ | 21 | 23 | + 1½ |
| 53⅜ | 37½ | 47¼ | 35 | $56,000,000 | $25 | Associated Oil | 50cQ | Dec. 31, 29 | 10 | 34½ | 34½ | 34½ | 34½ | — ½ |
| 62½ | 50 | 77⅞ | 30 | 50,000,000 | 25 | Atlantic Refining | ‡25cQ | Dec. 16, 29 | 31,000 | 38 | 38¾ | 36¾ | 37½ | — ⅜ |
| 53 | 20 | 49⅛ | 20 | 47,261,125 | 25 | Barnsdall Corp. A | 50cQ | Nov. 7, 29 | 41,000 | 23⅝ | 24 | 22¼ | 23½ | + ½ |
| 51⅛ | 20 | 49 | 38⅛ | 300,525 | 25 | do B | 50cQ | Nov. 7, 29 | ..... | ..... | ..... | ..... | ..... | ..... |
| 24½ | 12¼ | 32⅞ | 13¼ | (sh) 956,075 | N.P. | Beacon Oil | .... | ..... | 19,400 | 15 | 15⅛ | 13⅜ | 13¾ | + ¼ |
| 36 | 25¼ | 34½ | 25 | $51,524,150 | $25 | California Petroleum | .... | Jan. 1, 29 | ..... | ..... | ..... | ..... | ..... | ..... |
| ..... | ..... | 37¾ | 18 | (sh) 4,634,163 | N.P. | Continental Oil (Delaware) | .... | ..... | 52,100 | 22¼ | 23⅞ | 21½ | 22¾ | — ¼ |
| 94⅞ | 68 | 94¾ | 42¼ | 21,031,400 | 100 | General Asphalt | $1Q | Dec. 16, 29 | 21,000 | 48¾ | 50¾ | 46 | 48¾ | + ¼ |
| 141 | 110⅛ | 138 | 103½ | 6,628,200 | 100 | do pfd | $1.25Q | Dec. 2, 29 | ..... | ..... | ..... | ..... | ..... | ..... |
| 67 | 79 | 109 | 23 | 25,000,000 | 100 | Houston Oil | .... | ..... | 15,100 | 50 | 57 | 48 | 53½ | + 1½ |
| 38⅜ | 21¾ | 39¼ | 17¾ | (sh) 1,333,157 | N.P. | Independent Oil & Gas | 50cQ | Oct. 31, 29 | 16,900 | 22⅛ | 23¾ | 21½ | 22 | + ⅛ |
| 39⅝ | 9 | 53 | 13 | $4,299,190 | $10 | Indian Refining | .... | Dec. 15, 20 | 37,800 | 18 | 19¼ | 16⅛ | 17⅞ | — ⅜ |
| 37¼ | 8½ | 51¼ | 11½ | 4,550,110 | 10 | do ctfs | .... | ..... | 14,100 | 16⅛ | 17⅜ | 15¼ | 16 | 0 |
| 185 | 140 | 165 | 160 | 1,977,700 | 100 | do pfd. new | $1.75Q | Oct. 1, 29 | ..... | ..... | ..... | ..... | ..... | ..... |
| 39⅛ | 27⅜ | 38⅜ | 16½ | 3,992,387 | N.P. | Lago Oil & Transport | .... | May 2, 27 | 1,700 | 21 | 21⅝ | 21 | 21¼ | — 2¾ |
| 119¾ | 9⅜ | 18 | 7 | (sh) 1,187,298 | N.P. | Louisiana Oil Refining | .... | ..... | 11,400 | 8⅝ | 9⅛ | 8½ | 8⅝ | 0 |
| 96 | 78 | 100¼ | 80 | $4,000,000 | $100 | do pfd | $1.62½ | Nov. 15, 29 | ..... | ..... | ..... | ..... | ..... | ..... |
| 25½ | 12½ | 18½ | 7½ | (sh) 330,000 | N.P. | Maracaibo Oil | .... | ..... | 4,400 | 6½ | 6⅝ | 5⅛ | 5¼ | — ⅞ |
| 360 | 250 | 295 | 176 | $45,942,800 | $100 | Mexican Petroleum | $3Q | Oct. 20, 29 | 10 | 180 | 180 | 180 | 180 | — 1 |
| ..... | ..... | ..... | ..... | 12,000,000 | 100 | do pfd | $2Q | Oct. 20, 29 | ..... | ..... | ..... | ..... | ..... | ..... |
| 73 | 4⅝ | 69⅜ | 9¼ | (sh) 995,500 | N.P. | Mexican Seaboard | .... | Nov. 15, 24 | 31,000 | 17½ | 19¼ | 15¼ | 17½ | + ½ |
| 44½ | 25⅛ | 39⅞ | 22⅛ | (sh) 1,857,461 | N.P. | Mid-Continent | 50cQ | Nov. 15, 29 | 13,600 | 27 | 27¼ | 25⅜ | 27 | + ¼ |
| 120½ | 103¼ | 121 | 120¼ | $6,718,000 | $100 | do pfd | $1.75Q | Sept. 1, 29 | ..... | ..... | ..... | ..... | ..... | ..... |
| 7⅜ | 2⅜ | 5⅛ | ¾ | 23,849,720 | 10 | Middle States | .... | July 1, 23 | ..... | ..... | ..... | ..... | ..... | ..... |
| 5⅞ | 1½ | 3⅜ | ⅞ | 5,950,500 | 10 | do ctfs | .... | ..... | 5,800 | 1 | 1⅛ | ⅞ | 1⅛ | + ⅛ |
| 2¼ | 1 | 1½ | ⅝ | (sh) 3,500,000 | N.P. | Pacific Oil | .... | ..... | 3,600 | 1 | 1 | 1 | 1 | 0 |
| 55½ | 38¼ | 69 | 40¼ | $50,000,000 | $50 | Pan American P. & T | .... | Oct. 20, 27 | 800 | .... | 60 | 58 | 60 | + 4 |
| 58⅛ | 37¾ | 69¼ | 40½ | 121,101,400 | 50 | do B | .... | Oct. 20, 27 | 5,900 | 57 | 60⅞ | 57 | 58 | 0 |
| 28⅜ | 15½ | 17½ | 13½ | (sh) 400,000 | N.P. | Pan. American Western B | .... | Jan. 30, 27 | ..... | ..... | ..... | ..... | ..... | ..... |
| 21¾ | 11½ | 15¼ | 3 | (sh) 199,370 | N.P. | Panhandle P. & R | .... | ..... | 1,300 | .... | 6 | 4⅝ | 5½ | + ½ |
| 106¼ | 70 | 76 | 47½ | $2,935,200 | $100 | do pfd | .... | July 2, 23 | 200 | 50 | 50 | 50 | 50 | 0 |
| 53⅞ | 35¼ | 47 | 24¼ | (sh) 2,406,803 | N.P. | Phillips Petroleum | ‡50Q | Jan. 2, 30 | 18,200 | 32⅛ | 36 | 32 | 34⅝ | + 1⅛ |
| 5¼ | ½ | 3⅜ | 1 | $29,622,925 | $25 | Pierce Oil Corp | .... | ..... | 2,700 | 1 | 1 | 1⅛ | 1 | 0 |
| 50 | 16½ | 51½ | 20 | 15,000,000 | 100 | do pfd | .... | Feb. 1, 22 | 500 | 21 | 21 | 20 | 20 | — 1½ |
| 6⅝ | 3½ | 5⅞ | ½ | (sh) 2,500,000 | N.P. | Pierce Petroleum | ..... | ..... | 2,900 | 2½ | 2½ | 2¼ | 2¼ | — ¼ |
| 64⅝ | 59½ | 65⅞ | 40½ | $60,636,450 | $25 | Prairie Oil & Gas | ‡50cQ | Dec. 31, 29 | 9,300 | 52⅛ | 52¾ | 51⅜ | 51½ | — ½ |
| ..... | ..... | 65 | 45 | 101,250,000 | 25 | Prairie Pipe Line | ‡76cQ | Dec. 31, 29 | 3,200 | 56¾ | 59 | 56¾ | 59 | + 2¼ |
| 29⅞ | 16 | 25⅞ | 4 | 37,450,850 | 50 | Producers & Refiners | .... | Sept. 15, 23 | 3,200 | 8½ | 8⅞ | 8 | 8 | — 1 |
| 49⅝ | 41 | 46¾ | 25½ | 2,845,350 | 50 | do pfd | .... | May 1, 25 | 30 | 32 | 32 | 30 | 30 | — 2 |
| 31¼ | 19 | 30¾ | 20 | 75,959,255 | 25 | Pure Oil Co | 37½cQ | Dec. 16, 29 | 24,500 | 22⅝ | 24 | 22 | 23⅞ | — 1⅛ |
| 119 | 108 | 116 | 108 | 13,000,000 | 100 | do 8% pfd | $2Q | Jan. 2, 30 | 80 | 112¾ | 113 | 112¾ | 112¾ | 0 |
| 56 | 23½ | 49⅝ | 20 | 47,127,725 | 25 | Richfield Oil | 50cQ | Nov. 15, 29 | 29,800 | 24 | 25¾ | 22⅝ | 24¼ | — ⅛ |
| ..... | ..... | 42½ | 15 | (sh) 1,200,000 | N.P. | Rio Grande Oil Co | ‡$1S.A. | July 25, 29 | 8,200 | 18¾ | 20¼ | 18⅝ | 19½ | + ¾ |
| 64 | 44⅝ | 64 | 43⅛ | (sh) 546,646 | $13.40 | Royal Dutch N. Y. shares | $1.873 | Aug. 10, 29 | 10,500 | 51⅜ | 52½ | 50½ | 52 | + 1 |
| 57½ | 39⅜ | 55¾ | 43 | (sh) 65,203,000 | £2 | Shell Transport & T | $1.447 | July 23, 29 | ..... | ..... | ..... | ..... | ..... | ..... |
| 39⅜ | 23¼ | 31¾ | 19 | 12,254,979 | N.P. | Shell Union Oil | 35cQ | Dec. 31, 29 | 11,900 | 22⅞ | 23⅞ | 22⅛ | 23 | + ½ |
| 27¼ | 18⅛ | 40⅜ | 15 | $8,357,280 | $10 | Simms Petroleum | 40cQ | Dec. 14, 29 | 3,300 | 23 | 24⅛ | 22⅛ | 22¾ | — ¾ |
| 46¾ | 17⅜ | 45 | 21 | 5,494,095 | N.P. | Sinclair Consolidated | ‡50cQ | Oct. 15, 29 | 67,600 | 24 | 24¾ | 23 | 23½ | — ⅛ |
| 110 | 102½ | 111 | 103 | $16,025,200 | $100 | do pfd | $2Q | Nov. 15, 29 | 500 | 109½ | 109⅝ | 109½ | 109½ | 0 |
| 42⅝ | 25 | 46½ | 28 | 27,396,590 | 25 | Skelly Oil Co | 50cQ | Dec. 16, 29 | 6,800 | 30⅛ | 31⅜ | 30 | 30⅞ | + ⅛ |
| 80 | 53 | 81⅞ | 51½ | (sh) 13,016,435 | N.P. | S. O. California | ‡62½cQ | Dec. 16, 29 | 20,600 | 60⅞ | 61½ | 59⅜ | 59⅝ | — ¼ |
| 59¾ | 37¾ | 83 | 48 | $612,095,850 | $25 | S. O. New Jersey | ‡25cQ | Dec. 16, 29 | 92,400 | 62½ | 65½ | 60½ | 64½ | + 2⅛ |
| 45½ | 28¾ | 48⅛ | 31¾ | 434,094,575 | 25 | S. O. New York | 40cQ | Dec. 16, 29 | 105,500 | 32⅞ | 33 | 31¾ | 32¼ | — ⅝ |
| 77 | 31½ | 84¾ | 55 | (sh) 1,297,847 | N.P. | Sun Oil | ‡25cQ | Dec. 16, 29 | 2,100 | 56 | 57½ | 56 | 57 | + 2 |
| 110 | 110 | 105½ | 100 | $5,000,000 | $100 | do pfd | $1.50Q | Dec. 2, 29 | 10 | 103 | 103 | 103 | 103 | — 1⅞ |
| 14¼ | 2½ | 24 | 5¼ | (sh) 1,304,698 | N.P. | Superior Oil Corp | ..... | Dec. 20, 20 | 14,900 | 6¾ | 6⅞ | 5⅞ | 6⅛ | — ⅜ |
| 74⅝ | 50 | 71⅞ | 50 | $211,082,925 | $25 | The Texas Corp | 75cQ | Jan. 1, 30 | 21,000 | 55 | 56⅜ | 53½ | 56 | + ⅞ |
| 26⅝ | 12⅛ | 23⅞ | 9½ | 8,380,340 | 10 | Texas Pacific Coal & Oil | 2½%s | Sept. 30, 29 | 4,700 | 10¼ | 10⅜ | 10⅛ | 10⅜ | — ⅛ |
| 41½ | 19⅝ | 40 | 14 | (sh) 2,179,275 | N.P. | Tide Water Oil Co | 20cQ | Dec. 31, 29 | 1,700 | 21⅜ | 22¼ | 21 | 21 | — ¾ |
| 100⅛ | 86¾ | 97½ | 85⅛ | $20,321,000 | $100 | do 5½% pfd | $1.25Q | Nov. 15, 29 | 1,900 | 88 | 89 | 87½ | 87½ | — ½ |
| 25 | 14¾ | 23½ | 10 | (sh) 4,877,976 | N.P. | Tide Water Associated | ..... | Aug. 1, 27 | 32,600 | 12⅛ | 12¼ | 11⅜ | 11¾ | — ¾ |
| 91¾ | 81⅞ | 90⅞ | 74⅛ | $72,989,200 | $100 | do pfd | $1.50Q | Jan. 2, 30 | 1,000 | 81¾ | 81¾ | 81 | 81½ | + ⅜ |
| 14½ | 6¾ | 15¼ | 5⅛ | (sh) 3,842,029 | N.P. | Transcontinental Oil | ..... | ..... | 52,500 | 8⅛ | 8½ | 7⅞ | 8⅜ | — ⅛ |
| 58 | 42¾ | 54½ | 42⅛ | $40,858,375 | $25 | Union Oil of California | ‡50cQ | Nov. 9, 29 | 4,200 | 43¾ | 44⅝ | 43¼ | 44½ | + ½ |
| 128⅛ | 110 | 163¾ | 121⅞ | 31,101,200 | 100 | Union Tank Car Co | $1.25Q | Dec. 2, 29 | 500 | .... | 148 | 144¾ | 148 | + 6¼ |
| 44⅞ | 26 | 42⅞ | 15 | (sh) 488,359 | N.P. | Warner Quinlan | 50cQ | Oct. 1, 29 | 8,600 | 20 | 21 | 19½ | 20⅛ | — ⅜ |
| 38 | 20⅛ | 38 | 25 | (sh) 490,000 | N.P. | White Eagle Oil & Refining | 50cQ | Oct. 21, 29 | 4,600 | 27 | 27⅜ | 26¼ | 27 | + ½ |
| 22⅛ | 17¼ | 29¾ | 12⅞ | (sh) 428,967 | N.P. | Wilcox Oil & Gas | .... | May 10, 28 | 1,500 | 14½ | 14½ | 14 | 14 | — 1 |

*New High †New Low xEx-Dividends ‡Also Extras s-Stock Total Sales 916,240

## Pittsburgh Stock Exchange

**Transactions week ended Dec. 28, 1929**

| | Sales | High | Low | Last | Change |
|---|---|---|---|---|---|
| Ark. Nat. Gas | 375 | 10 | 8¾ | 10 | +1⅜ |
| do pfd | 839 | 7⅞ | 7½ | 7½ | — ¾ |
| Devonian Oil | 260 | 12 | 11 | 11 | —1 |
| Dixie & Util. pfd | 60 | 70 | 70 | 70 | 0 |
| Lone Star Gas | 4,360 | 34 | 32½ | 33½ | — ½ |
| do pfd | 186 | 105 | 104¾ | 105 | + ½ |
| Plymouth Oil | 365 | 27½ | 26½ | 26½ | — ½ |
| Pgh. Oil & Gas | 2,975 | 3 | 3 | 3 | 0 |
| Petroleum Explor. | 100 | 30½ | 30½ | 30½ | — ½ |
| Shamrock O & G | 1,700 | 18 | 17 | 17¾ | — ¼ |
| Wiser Oil | 260 | 18¼ | 17½ | 18¼ | +1¼ |

## Pittsburgh Curb Market

**Transactions week ended Dec. 28, 1929**

| | Sales | High | Low | Last | Change |
|---|---|---|---|---|---|
| Arkansas Gas A | 250 | 9⅜ | 8¼ | 9¾ | +1⅝ |
| Dunmar Oil | 5,000 | .15 | .... | .... | .... |
| Leonard Oil & Dev. | 1,000 | 1½ | 1½ | 1½ | —1½ |
| Columbia Synd | 9,600 | .25 | .25 | .25 | .... |
| Middle States Oil | 800 | 1 | 1 | 1 | .... |

## Oil Dividends

| | Amount | Payable | Stock of Record |
|---|---|---|---|
| Tide Water Assoc. s. a. | 30c | Feb. 15 | Jan. 31 |
| do s.a. | 30c | Aug. 15 | July 31 |

### Acquires Two Companies

TULSA, Dec. 28.—Two Independent oil companies operating in Nebraska have been purchased by the Mid-Continent Petroleum Corp., and possession will be given Jan. 1. One company is the Ashland Oil Co., of Ashland, and the other the W. B. Watson stations at Albion, David City, Staplehurst, Octavia and Raeville. The two companies will be under the management of the Waterloo division.

### Shell Buys Carolina Marketer

RICHMOND, Va.—The Mecklenburg Oil Co., of 50 stations organized seven years ago at Charlotte, N. C., by Lloyd C. and Carl E. Eaton, has been purchased by the Shell Eastern Petroleum Products, Inc., of Baltimore. The Eaton brothers remain in charge as exclusive distributors of Shell products.

### N. Dakota Jobbers Meet In January

MINNEAPOLIS, Dec. 30.—The North Dakota division of the Northwest Petroleum Association will gather for its annual convention Jan. 30 and 31 at Grand Forks, N. D., according to Paul E. Hadlick, secretary.

### Fire Marshals Meet In January

WASHINGTON—The Fire and Safety Marshals of the National Petroleum Association will hold its annual meeting Jan. 24 at the William Penn hotel, Pittsburgh, according to Fayette B. Dow, general counsel of the association. R. A. Wotowitch, Cities Service Oil Co., and trustee in charge of the association, is arranging the program. James H. Herbert, president of the marshals, E. M. Lyons, president of the association, and Mr. Dow, are on the committee on arrangements.

# Standard Oil Stocks on New York Curb

| 1928 High | 1928 Low | 1929 High | 1929 Low | Outstanding Capital | Par Value | Stocks | Div. Rate | Last Paid | Transactions Week Ended Dec. 28 Sales | First | High | Low | Last | Change |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22⅜ | 14⅞ | 18¾ | 14¼ | £4,126,460 | £ 1 | Anglo-American Oil | 36c | June 5, 29 | ..... | ..... | ..... | ..... | ..... | ..... |
| 21¼ | 15 | 18 | 13 | ..... | ..... | do certificates | 36c | June 5, 29 | 12,400 | 17 | 17 | 16¾ | 17 | + ⅛ |
| 20½ | 14⅜ | 17 | 11 | ..... | £ 1 | do ctfs. non-voting | 36c | June 5, 29 | 12,700 | 17 | 17⅛ | 16¾ | 17⅛ | + ¼ |
| 5 | 1¼ | 2½ | .75 | (sh) 500,000 | N.P. | Atlantic Lobos | ..... | ..... | 5,200 | ¾ | ¾ | ¾ | ¾ | — ¼ |
| 9¾ | 3¼ | 4⅛ | 1 | $10,000,000 | $50 | do pfd | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 56 | 44½ | 46½ | 25 | $1,000,000 | 25 | Borne-Scrymser | $1 S.A. | Oct. 15, 29 | ..... | ..... | ..... | ..... | ..... | ..... |
| 76 | 58 | 74¼ | 55 | 10,000,000 | 50 | Buckeye Pipe Line | ‡$1Q | Dec. 14, 29 | 100 | 68⅛ | 68⅜ | 68½ | 68½ | + ¼ |
| 161 | 117¼ | 210 | 130 | 3,000,000 | 25 | Chesebrough Mfg | ‡$1Q | Sept. 30, 29 | 100 | 143 | 143 | 143 | 143 | — 2 |
| 23 | 16 | 29 | 8⅛ | 36,123,350 | 10 | Continental Oil | ..... | Dec. 15, 27 | 18,200 | 14¼ | 14¼ | 12⅝ | 13¼ | — 3 |
| 17½ | 9½ | 11¾ | 5⅜ | ..... | N.P. | Creole Petroleum | ..... | ..... | 26,400 | 6½ | 6½ | 6 | 6 | — ½ |
| 82 | 67 | 95 | 40 | 1,500,000 | 50 | Cumberland Pipe Line | $1Q | Dec. 16, 29 | 300 | 43 | 43 | 40½ | 40½ | — ½ |
| 88 | 64⅛ | 70½ | 42 | 5,000,000 | 100 | Eureka Pipe Line | $1Q | Nov. 1, 29 | ..... | ..... | ..... | ..... | ..... | ..... |
| 13 | 4¼ | 7 | 3⅝ | 16,000,000 | 100 | Galena Signal Oil | ..... | June 30, 25 | 400 | 4¼ | 5 | 4¼ | 5 | — 1 |
| 86 | 26 | 90 | 73½ | 4,000,000 | 100 | do new pfd | ..... | June 30, 26 | 50 | 81½ | 81½ | 81½ | 81½ | — 3½ |
| 89¾ | 35 | 88 | 71½ | 2,000,000 | 100 | do old pfd | ..... | June 30, 26 | 450 | 71½ | 75 | †71½ | 75 | + 1½ |
| 114¾ | 59¼ | 128 | 74⅛ | 73,685,700 | 25 | Humble Oil & Refining | 50cQ | Jan. 1, 30 | 6,600 | 82⅝ | 83⅞ | 82¼ | 83⅛ | — 1 |
| 290½ | 176½ | 340½ | 260 | 20,000,000 | 100 | Illinois Pipe Line | $10S.A. | Dec. 16, 29 | 1,400 | 307 | 310 | 300 | 308 | — 2 |
| 104 | 56¾ | 41 | 22 | (sh) 26,421,768 | N.P. | Imperial of Canada | 12½cQ | Dec. 2, 29 | 21,800 | 25¼ | 27⅛ | 25⅛ | 26⅝ | + 1⅛ |
| 91⅞ | 74⅝ | 41⅞ | 26 | $1,000,000 | $10 | Indiana Pipe Line | ‡50cQ | Nov. 15, 29 | 1,400 | 40 | 40 | 39⅞ | 40¼ | — ⅞ |
| 55 | 35 | 29⅜ | 15 | (sh) 14,247,088 | N.P. | International Petroleum | 12½c | June 25, 29 | 9,900 | 20½ | 21⅞ | 20 | 21⅞ | + 1¼ |
| 32⅜ | 19⅜ | 25⅞ | 10½ | $6,363,350 | 12.50 | National Transit Co | 25cQ | Sept. 16, 29 | 1,900 | 21⅞ | 21⅞ | 21¾ | 21⅞ | + ⅜ |
| 75 | 38½ | 85 | 72 | 1,000,000 | 10 | New York Transit | 40c | Oct. 15, 29 | ..... | ..... | ..... | ..... | ..... | ..... |
| ..... | ..... | ..... | ..... | ..... | ..... | do new | ..... | ..... | 200 | 15 | 15 | 14⅞ | 15 | 0 |
| 69 | 56½ | 63 | 41 | 2,000,000 | 50 | Northern Pipe Line | $2 S.A. | Jan. 2, 30 | ..... | ..... | ..... | ..... | ..... | ..... |
| 83½ | 58½ | 79⅞ | 64⅛ | 60,000,000 | 25 | Ohio Oil Co | ‡50cQ | Dec. 14, 29 | 600 | 70¾ | 71⅛ | 70 | 71⅛ | + ⅜ |
| 84 | 28 | 44½ | 18⅝ | 10,000,000 | 25 | Penn Mex. Fuel | $1 | Dec. 14, 29 | 200 | 20 | 20⅜ | †18⅝ | 20 | + 1 |
| 220 | 167 | 50 | 29 | 4,000,000 | 25 | Solar Refining | $1.25S.A. | Dec. 20, 29 | 300 | 34⅞ | 34⅞ | 30 | 30 | + 1 |
| 19 | 12 | 23½ | 13 | 1,000,000 | 10 | Southern Pipe Line | $10 | Dec. 31, 29 | 100 | 14 | 14 | 14 | 14 | 0 |
| 71⅞ | 36¾ | 60¼ | 35⅛ | 30,000,000 | 25 | South Penn Oil | ‡50cQ | Dec. 30, 29 | 2,000 | 39¾ | 40½ | 39½ | 40½ | + ½ |
| 102 | 70 | 70 | 45 | 1,750,000 | 50 | South West Pa. Pipe Lines | $1 | Dec. 31, 29 | 50 | 55 | 55 | 55 | 55 | + 5⅜ |
| 95⅞ | 70⅞ | 63 | 45 | 348,175,069 | 25 | S. O. Indiana | ‡62½cQ | Dec. 16, 29 | 23,100 | 52⅞ | 54¾ | 52¼ | 54 | + 1⅛ |
| 27¾ | 15 | 33¾ | 18 | 8,000,000 | 25 | S. O. Kansas | ‡50cQ | Dec. 16, 29 | 1,100 | 26½ | 28 | 26½ | 28 | + 1½ |
| 49 | 44 | 46⅜ | 29 | 25,654,516 | 10 | S. O. Kentucky | ‡40cQ | Dec. 31, 29 | 7,200 | 33⅛ | 33⅞ | 32 | 33¾ | + ¾ |
| 54⅝ | 39⅞ | 50¼ | 40 | 4,649,225 | 25 | S. O. Nebraska | ‡62½cQ | Dec. 20, 29 | 100 | 43 | 44 | 43 | 44 | + 1 |
| 134 | 71 | 129 | 60 | 14,000,000 | 25 | S. O. Ohio | 62½cQ | Jan. 2, 30 | 50 | 80¾ | 80¾ | 80¼ | 80½ | — 1⅝ |
| 125 | 116 | 125½ | 106 | 7,000,000 | 100 | do pfd | $1.75Q | Dec. 2, 29 | 40 | 117½ | 117⅝ | 117½ | 117½ | — ¾ |
| 23¼ | 16 | 18 | 5⅛ | 861,466 | 25 | Swan Finch | 30c | Jan. 15, 29 | ..... | ..... | ..... | ..... | ..... | ..... |
| 111 | 72 | 133¾ | 75 | 126,154,000 | 25 | Vacuum Oil | ‡$1Q | Dec. 20, 29 | 4,800 | 95 | 96 | 93¾ | 94½ | — 1⅜ |

•New High †New Low ‡Also Extras

# Independent Oils on New York Curb

| 1928 High | 1928 Low | 1929 High | 1929 Low | Par Value | Stocks | Transactions Week Ended Dec. 28 Sales | First | High | Low | Last | Change |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1½ | .53 | .72 | .125 | $5 | Amer. Cons. Oilfields | 6,000 | 1/16 | 1/16 | 1/16 | 1/16 | 0 |
| 9½ | 3⅛ | 8⅝ | 1⅛ | N.P. | Amer. Maracaibo | 4,500 | 1½ | 1⅝ | 1½ | 1⅝ | + ⅛ |
| 4½ | 2¼ | 4¾ | 1 | $10 | Argo Oil | 100 | 1 | 1 | 1 | 1 | 0 |
| 3¾ | 3⅜ | 26 | 3¾ | N.P. | Arkansas Nat. Gas | 3,900 | 8½ | 9⅞ | 8½ | 9½ | + 1 |
| .... | .... | 24¾ | 6½ | N.P. | do A | 22,800 | 8⅛ | 9½ | 8⅛ | 9⅜ | + ⅞ |
| .... | .... | 9 | 4 | 10 | do pfd | 500 | 7¾ | 7¾ | 7¾ | 7¾ | — ⅛ |
| 55 | 32¾ | 70 | 50 | N.P. | British American Oil | ..... | ..... | ..... | ..... | ..... | ..... |
| 23⅞ | 3¾ | 4⅞ | 1 | 25c | Carib Syndicate | 1,900 | 1 | 1⅛ | 1 | 1 | 0 |
| .... | .... | 68⅛ | 20 | N.P. | Cities Service new | 68,900 | 24¾ | 26⅜ | 24⅛ | 26⅜ | + 1¾ |
| 103½ | 94½ | 99¼ | 84 | 100 | do pfd | 1,800 | 88⅞ | 88⅞ | 88¼ | 88⅞ | 0 |
| 9⅜ | 8⅞ | 9¼ | 8 | 10 | do pref. B | ..... | ..... | ..... | ..... | ..... | ..... |
| 97 | 88½ | 96 | 81 | 100 | do pref. BB | ..... | ..... | ..... | ..... | ..... | ..... |
| 2¼ | 1 | 1½ | ¼ | 1 | Colombia Syndicate | 18,400 | 3/8 | 3/8 | ¼ | ¼ | — ⅛ |
| 17¾ | 9¾ | 15 | 3⅞ | N.P. | Colon Oil | 8,200 | 5⅛ | 5¼ | 5 | 5⅛ | 0 |
| 8⅞ | 6¼ | 11⅜ | 2½ | 10 | Consolidated Royal | 1,200 | 4½ | 4½ | 4½ | 4½ | 0 |
| .... | .... | 135 | 42 | N.P. | Cosden Oil Co | 3,100 | 80 | 80 | 80 | 80 | + 5 |
| .... | .... | 82 | 55 | .... | do pfd | 100 | 62 | 62 | 62 | 62 | — 1 |
| 3¼ | .76 | 2⅛ | ¼ | N.P. | Crown Central | 4,200 | ¼ | ⅜ | ¼ | ⅜ | + ⅛ |
| 15 | 6¾ | 11¾ | 4 | N.P. | Crystal Oil | ..... | ..... | ..... | ..... | ..... | ..... |
| 50 | 48 | 51⅜ | 51⅛ | $100 | do pfd | ..... | ..... | ..... | ..... | ..... | ..... |
| 33½ | 8⅛ | 26 | 6½ | N.P. | Darby Petroleum | 3,800 | 8⅞ | 9 | 8½ | 8½ | — ⅜ |
| 2⅞ | 1 | 11 | 2 | N.P. | Derby Oil & Refining | 1,100 | 5⅛ | 5¼ | 5⅛ | 5¼ | + ½ |
| 21⅛ | 7½ | 44 | 5 | N.P. | do pfd | ..... | ..... | ..... | ..... | ..... | ..... |
| 165 | 101⅛ | 209 | 115 | $25 | Gulf Oil Corp | 3,800 | 135 | 138¾ | 130⅛ | 133⅜ | + ⅜ |
| 7½ | 5⅝ | 7½ | 1⅜ | 5 | Homaokla Oil | 2,800 | 3¼ | 3 | 3 | 3 | — ½ |
| .... | .... | 49¼ | 5 | $1 | Indian Territory | 6,800 | 18¼ | 20¼ | 18¼ | 20¼ | + 2 |
| 3⅜ | 1 | 2⅞ | ⅜ | 10 | Intercontinental Pet | 7,900 | 7/8 | 7/8 | ¾ | ¾ | — ⅛ |
| 3 | ½ | 3⅜ | 1¼ | N.P. | Kirby Petroleum | 900 | 1⅜ | 1⅜ | 1⅜ | 1⅜ | 0 |
| 9⅛ | 5⅛ | 6⅛ | 1 | N.P. | Leonard Oil & Dev | 3,400 | 1⅜ | 1½ | 1⅜ | 1⅜ | — ⅜ |
| 43⅜ | 20 | 38⅞ | 18 | N.P. | Lion Oil & Refg | 14,400 | 19⅝ | 19⅝ | 19½ | 19½ | + ⅜ |
| .... | .... | 67⅞ | 28 | N.P. | Lone Star Gas | 1,900 | 33 | 34¼ | 33 | 34 | + 1 |
| 1⅞ | .50 | 1¼ | ¼ | 1 | Magdalena Syndicate | 2,800 | 1/16 | 1/16 | ¼ | 1/16 | 0 |
| 48½ | 32 | 38½ | 15 | N.P. | Margay Oil | 1,900 | 15½ | 15½ | 15½ | 15½ | + ½ |
| 8 | 2¾ | 6⅜ | 2½ | N.P. | Mexico-Ohio Oil | 800 | 3 | 3 | 2½ | 2½ | — ½ |
| .... | .... | 42 | 8 | N.P. | Missouri-Kan. P. L | 3,900 | 19¼ | 19⅞ | 18⅝ | 19 | — ¼ |
| 1¾ | .76 | 1⅛ | ¼ | 1 | Mountain & Gulf | 4,200 | ½ | ⅝ | ½ | ½ | — ⅛ |
| 28⅞ | 19½ | 22⅞ | 7 | 10 | Mountain Producers | 6,800 | 8⅛ | 8½ | 7⅝ | 7⅝ | — ½ |
| .... | .... | 43⅞ | 24 | N.P. | Nat. Fuel Gas (new) | 1,400 | 25½ | 25¾ | 25⅛ | 25½ | + ½ |
| 5⅜ | 4¼ | 5 | 2¼ | 5 | New Bradford | ..... | ..... | ..... | ..... | ..... | ..... |
| 5½ | 3 | 3⅞ | 2⅜ | 10 | New England Fuel | 1,500 | 3½ | 3¾ | 3½ | 3¾ | 0 |
| 11⅞ | 7⅛ | 9⅜ | 2¼ | 1 | New Mex. & Ariz | 1,700 | 3⅞ | 4¾ | 3⅝ | 4 | + ⅛ |
| 15½ | 11½ | 24½ | 11⅛ | 25 | New York Petrol | 800 | 16⅛ | 16⅝ | 15¾ | 16⅝ | + 1¾ |
| 13¼ | 8⅛ | 18½ | 6⅜ | N.P. | North Cent. Texas | 300 | 8½ | 8½ | 8 | 8⅛ | — ⅝ |
| .... | .... | 19¼ | 8⅜ | N.P. | Oil Stock, Ltd. A | 600 | 9⅛ | 9¼ | 9⅛ | 9⅛ | — ⅜ |
| .... | .... | 18¼ | 10 | N.P. | do B | ..... | ..... | ..... | ..... | ..... | ..... |
| 26¼ | 20 | 26⅝ | 12⅛ | N.P. | Pacific Western Oil | 700 | 13 | 13⅛ | †12⅛ | 12⅜ | — ¾ |
| 6 | 2¼ | 3½ | ½ | N.P. | Pandem Oil | 4,700 | 1/8 | 1/8 | 1/8 | 1/8 | + ¼ |
| 15⅝ | 8½ | 10½ | 2⅜ | N.P. | Pantepec Oil | 1,700 | 2⅞ | 2⅞ | 2⅜ | 2½ | — ½ |
| 20 | 10⅜ | 25½ | 22½ | $25 | Paragon Refg. B. ctfs. | ..... | ..... | ..... | ..... | ..... | ..... |
| .... | .... | 34½ | 17 | N.P. | Petroleum Corp | 5,900 | 20¼ | 20⅜ | 19⅞ | 19⅞ | — ⅜ |
| 31⅜ | 26½ | 37 | 22 | N.P. | Plymouth Oil | ..... | ..... | ..... | ..... | ..... | ..... |
| 18 | 8 | 16 | 9⅛ | 25 | Red Bank Oil | 100 | 9⅛ | 9⅛ | †9⅛ | 9⅛ | — ⅜ |
| 13 | 4⅛ | 8½ | 1⅜ | N.P. | Reiter-Foster | 1,400 | 2½ | 2½ | 2¼ | 2¼ | — ¼ |
| 31½ | 23¼ | 25½ | 19 | $25 | Richfield pfd | 1,400 | 22 | 22 | 21¾ | 21¾ | — ¼ |
| .... | .... | 29 | 13 | .... | Root Refining pfd | 100 | 17 | 17 | 17 | 17 | 0 |
| 12 | 4⅜ | 11 | 3 | N.P. | Ryan Consolidated | 500 | 3⅞ | 3⅞ | 3¾ | 3¾ | 0 |
| 7¼ | 5½ | 5⅞ | 1⅞ | $10 | Salt Creek Cons | ..... | ..... | ..... | ..... | ..... | ..... |
| 35 | 23¼ | 25⅞ | 9 | 10 | Salt Creek Prod | 1,800 | 10¼ | 10¼ | 9⅝ | 9¾ | — ⅛ |
| 3½ | 1 | 2½ | ½ | 5 | Savoy Oil | 200 | 1/8 | 1 | 1/8 | 1 | 0 |
| 40 | 27 | 33⅛ | 10 | 25 | Shreveport El Dorado | ..... | ..... | ..... | ..... | ..... | ..... |
| .... | .... | 24 | 11⅜ | N.P. | Southland Royalty | 5,100 | 11¾ | 15¾ | 11¾ | 14 | + 2¼ |
| .... | .... | 12 | 4 | N.P. | Sunray Oil | 800 | 7 | 7 | 6 | 6 | — ⅝ |
| .... | .... | 23 | 7⅛ | N.P. | Texon Oil & Land new | 400 | 9¾ | 9¾ | 8 | 8⅛ | — 1⅞ |
| 22⅜ | 13 | 16⅞ | 11⅜ | $10 | Tidal Osage | ..... | ..... | ..... | ..... | ..... | ..... |
| 21¼ | 13⅛ | 16½ | 10⅛ | 10 | do not-voting | ..... | ..... | ..... | ..... | ..... | ..... |
| 93¾ | 75 | 155 | 80 | 100 | Transcontinental pfd | ..... | ..... | ..... | ..... | ..... | ..... |
| 74⅛ | 18 | 81⅛ | 66 | 10 | Venezuela-Mexico | 1,000 | 77 | 77 | 77 | 77 | 0 |
| 9⅛ | 4¾ | 6½ | 1⅜ | 3 | Venezuelan Petrol | 3,600 | 2⅝ | 2⅝ | 2¼ | 2⅜ | — ⅛ |
| .... | .... | 2¼ | 66 | N.P. | White Star Oil | ..... | ..... | ..... | ..... | ..... | ..... |
| 8¼ | 4⅞ | 9⅛ | 2 | 1 | Woodley Petroleum | 5,100 | 3 | 3 | 2⅞ | 2 | + ¼ |
| ⅜ | ⅛ | 5⅜ | ¼ | 25 | Y Oil & Gas | 1,100 | ¾ | ¾ | †¼ | ¼ | — ½ |

•New High †New Low

# New York Bonds

**Week Ending Dec. 27**

| | High | Low | Last | Change |
|---|---|---|---|---|
| Asso. Oil Gold 6s | 102¼ | 101¾ | 101¾ | — ¼ |
| Atlantic Refg. deb. 5s | 100⅝ | 100 | 100 | —1 |
| Cal. Pet. 5s | 95 | 94 | 94 | —1 |
| Cal. Pet. 5½s | 99⅛ | 98¼ | 99 | + ½ |
| General Pet. 5s | 102 | 100¼ | 100¾ | — ¼ |
| Humble Oil & Refg. 5s | 100¾ | 100 | 100 | — ¾ |
| Humble Oil & Refg. 5½s | 101¾ | 101¼ | 101¼ | — ⅜ |
| Pan Amer. P & T 6s | 103¾ | 103½ | 103½ | — ½ |
| Pan Amer. P & T 6s | 95 | 93 | 93 | —4 |
| Phillips Pet. 5½s | 92½ | 91 | 92¼ | 0 |
| Pure Oil 5½s | 100¼ | 100 | 100 | 0 |
| Richfield Oil Calif. 6s | 97½ | 95 | 96 | —1 |
| Shell Union Oil 5s | 95¾ | 94 | 95¼ | +1¼ |
| Sinclair Con. Oil 7s | 101⅛ | 100½ | 101 | + ⅜ |
| Sinclair Con. Oil 6½s | 100 | 99¼ | 99½ | — ⅜ |
| Sinclair Con. Oil 6s D | 100⅛ | 100 | 100 | 0 |
| Sinclair Con. Crude 5½s | 97¼ | 96¾ | 96¾ | 0 |
| Sinclair Pipeline | 94¾ | 94⅜ | 94⅜ | — ¼ |
| Skelly Oil 5½s | 93¾ | 92½ | 93½ | — ½ |
| S. O. N. J. 5s | 102⅝ | 101¾ | 101¾ | — ¾ |
| S. O. N. Y. 4½s | 96⅝ | 96 | 96 | —1 |
| Union Oil of Calif. 6s A | 106¾ | 106¾ | 106¾ | 0 |
| Union Oil of Calif. 1st 5sA | 97⅞ | 98⅞ | 98⅞ | + ⅞ |
| Union Oil of Calif. 5s C | 98⅞ | 98⅛ | 98⅜ | — ¾ |
| White Eagle Oil 5½s | 103 | 101⅛ | 103 | +2½ |

# New York Curb Bonds

**Week Ending Dec. 27**

| | High | Low | Last | Change |
|---|---|---|---|---|
| Beacon Oil 6s '36 | 105½ | 105½ | 105½ | + ½ |
| Cities Service 5s '66 | 84 | 83¼ | 83¼ | —1¼ |
| Cities Service G. 5½s '42 | 84¾ | 83½ | 84 | — ⅜ |
| Cont. Oil 5½s '37 | 93¼ | 92¾ | 93¼ | — ¼ |
| Empire O & R 5½s '42 | 84¾ | 80 | 83⅜ | —1⅜ |
| Gulf Oil 5s '37 | 99½ | 99 | 99¼ | + ⅛ |
| Gulf Oil 5s '47 | 100 | 98¾ | 100 | —1 |
| Independent Oil 6s '39 | 103 | 102½ | 102½ | 0 |
| Shell Union Oil 5s '49 | 98 | 97½ | 97⅞ | + ⅛ |
| Sun Oil 5½s '39 | 100½ | 100 | 100 | — ½ |
| Valvoline Oil 7s '37 | 102½ | 102½ | 102½ | — ¾ |

# Cleveland Stock Market

| Dec. 27 | Par Value | Bid | *Asked |
|---|---|---|---|
| Canfield Oil Co | $100 | x100 | 135 |
| do pfd | 100 | x102 | .... |
| Fred G. Clark, Inc | 10 | 10½ | 11 |
| National Refining Co | 25 | 34⅛ | 35½ |
| do pfd | 100 | ... | x135 |
| Paragon Refining Co | 25 | 9 | 9½ |
| do pfd | N.P. | x32¼ | 41 |
| do ctfs | ... | ... | 10½ |

x Ex Dividend.

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(*Continued from Page* 98)

claims had been adjusted and the reorganization plan is now operative.

Depositors of old stock will receive $75 cash and two shares of common stock in the new corporation for each share of either class of preferred stock they held in the old corporation. Common stock will be exchanged share for share.

The new company will have outstanding 280,000 shares of no par common stock.

## Financial Notes

**Middle States Oil Corp.**—Receiver Joseph Glass has stated that the announced refund of $2,564,290 federal income taxes recently granted the company, is not a cash refund but the reduction of over-assessments on 1921 and 1922 earnings. When the company went into receivership in 1924 there were tax claims of $15,556,244 against it. The receiver announced that these claims have largely been eliminated and only a small amount is still the subject of negotiations.

**Tide Water-Associated Oil Co.**—Dividends at the rate of 60 cents annually have been resumed on the common stock. The first semi-annual dividend of 30 cents has been declared payable Feb. 15 to stock of Jan. 31 record. The dividend is said to be less than 40 per cent of the 1929 earnings available for the common stock. The company now owns 95.42 per cent of the common stock of the Tide Water Oil Co. and 95.33 per cent of the common stock of the Associated Oil Co.

**Honolulu Consolidated Oil Co.**—Subsidiary called Honolulu Oil Co. has been organized with capital of 10,000 no par common shares to develop 40,000 acres held by the parent company in Texas and New Mexico. Directors of the new company are W. T. Fitzgerald, F. C. Hutchens, W. L. Holloway, G. H. Elmore, and C. C. Kreis.

**Anglo-American Oil Co., Ltd.**—Acceptance of the Standard Oil Export Corp. offer to exchange its preferred stock for Anglo-American, has been made by holders of several large stockholders of Anglo-American on a basis of one share of $100 preferred for 5 5/9 shares of Anglo-American.

**International Petroleum Co.**—Crude oil production in Colombia in the first 10 months of 1929 totaled 16,979,353 barrels as compared with 16,548,928 barrels in the corresponding time of 1928. Shipments totaled 15,136,565 barrels this year and 14,994,210 barrels last year. In Peru the company produced 9,054,013 barrels in the first 10 months of this year and 7,783,832 barrels the first 10 months of 1928. Shipments from Peru were 4,244,086 barrels this year and 3,373,949 barrels last year.